

Conservation

Forests, Waters,
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NOVEMBER

1909



Published by THE AMERICAN FORESTRY ASSOCIATION, 1417 G St. N. W., Washington, D. C.
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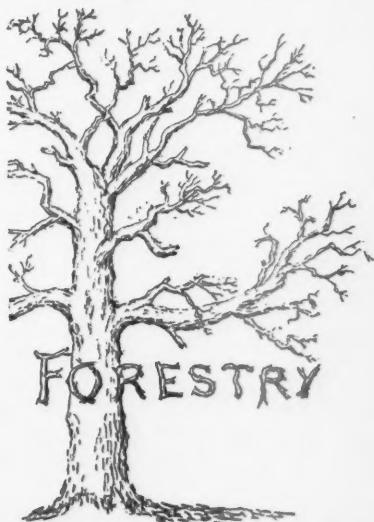
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CONSERVATION

OFFICIAL MAGAZINE
OF THE
AMERICAN FORESTRY ASSOCIATION

CONTENTS FOR NOVEMBER, 1909

COVER DESIGN—By Charles E. Cartwright.

BLUE GUM (*Eucalyptus*), SHOWING BARK, LEAVES, AND FLOWERS.. *Frontispiece*

HOW OUR FORESTS ARE WASTED, AND WHY THE NEED OF GOVERN-
MENT CONTROL—By S. T. Kelsey..... 657

THE FUNCTION OF THE FOREST—By Dr. N. Kaumanns..... 671

RESERVOIRS ON CHIPPEWA RIVER—By Hon. Thad C. Pound..... 679

PEOPLE'S RIGHT TO RUNNING WATER—By Harrison Williams..... 683

SUGGESTION FOR THE CONSERVATION OF PETROLEUM—By Roswell H.
Johnson..... 685

THE WESTERN PHOSPHATE LANDS—By Morse S. Duffield..... 686

THEODORE ROOSEVELT, DYNAMIC GEOGRAPHER—By Frank Buffington
Vrooman..... 689

THE NEW POLITICAL SCHOOL—By Thos. Elmer Will..... 696

EDITORIAL—

Competitive Methods.....	699	CONSERVATION Not Owned by Mr. Pinchot.....	703
Make the Rivers Available for Transportation..	700	Whither Are We Drifting?.....	704
Farmers Building Their Own Roads.....	701	Whose Is the Land?.....	705
The Dry-farming Congress at Billings.....	701	More "Progress" Backward.....	705
Where to Get the Money.....	702	Power and Similar Bills.....	707
Courts, Congress, and Conservation.....	702		

THE FOREST GIANT (*Poem*)—By Charles Albert Brewton..... 708

NEWS AND NOTES—

Mr. Start Made Secretary.....	709	Conserving Miners' Lives.....	717
Conservation Congress Resolutions.....	709	Drainage Circulars.....	718
President Taft to the Conservation Congress.....	709	Redeeming the Great Valley of California.....	718
President Taft on Conservation.....	709	A National Land Exposition in Chicago.....	719
Mr. Pinchot at the Trans-Mississippi Congress..	710	The National Land Laws.....	719
Mr. Pinchot at the Conservation Congress at Seattle.....	711	Let's Focus on Something for Conservation...	719
Mr. Pinchot's Conservation Ideas and Municipal Franchises.....	712	Colorado Conservation Commission Resolutions...	720
Hawaii Wide Awake.....	712	Japanese Visitors in America.....	720
The Changing Sentiment.....	712	Waterways Meetings.....	720
Single-taxers with Forester Pinchot.....	713	Meeting of the American Society of Mechanical Engineers.....	721
Irrigation at Yakima.....	713	The Nature Lovers' League.....	721
Reclamation Service Notes at Billings.....	713	California to Raise Eastern Hardwood.....	721
Floods and Forests.....	716	The Smoke Nuisance.....	721
Enrollment in Pennsylvania State College.....	7	Soil Fertility the Foundation of Progress.....	722
Need for Protecting Pacific-coast Forests.....	716	Maine's Timber Loss.....	722
Forestry Pamphlets.....	716	Reforestation in Ontario.....	722
Meeting of Connecticut Forestry Association..	716	Forestry in California.....	722
The First National Forest in the United States..	716	Saving the Great Oak at Edgewood.....	723
Forestry Patrol Recommended.....	717	Exhaustion of Mineral Resources.....	723
State Control of Maine Forests.....	717	Utilizing Waste.....	724
Governor Hughes on Forest Conservation.....	717	Squirrels Menacing Forests.....	724
		Making Engines Spark-proof.....	724

CONSERVATION is the official organ of the American Forestry Association. Price, \$2.00 per year, including Annual Membership in the Association. Entered as second-class matter August 1, 1908, at the Post-office at Washington, D. C., under the Act of March 3, 1879

Published Monthly at
1417 G STREET, N. W. WASHINGTON, D. C.

The American Forestry Association

President—CURTIS GUILD, Jr.

Former Governor of Massachusetts

The American Forestry Association was organized in 1882, and incorporated in January, 1897. It now has over 7,000 members, residents of every State in the Union, Canada, and foreign countries. From its organization it has been the tireless friend of the forests.

The object of the Association is to promote the preservation, by wise use, and the extension of the forests of the United States; its means are agitation and education; it seeks to encourage the application of forestry by private owners to forest holdings, large or small; and it favors, especially, the establishment and multiplication of National and State forests, to be administered in the highest interests of all.

The Association seeks as members all who sympathize with its object and methods, and who believe that our natural resources constitute a common heritage, to be used without abusing and administered for the common good. Seeking to conserve our supplies of wood and water, the Association appeals especially to wood-producers and users, including owners of wood lands, lumbermen, foresters, railroad men, and engineers; and to those dependent upon equable stream flow, as manufacturers, irrigators, employers of water power, and those engaged in internal commerce.

The Association meets annually in Washington. It publishes, monthly, *CONSERVATION*, the magazine of authority in its special field. The list of contributors to this publication includes practically all persons prominent in forest work in the United States, making it alone worth the cost of Annual Membership in the Association.

The dues, covering a subscription to *CONSERVATION*, are as follows: Annual—For Annual Members, \$2; for Sustaining Members, \$25; Total, with exemption from all other payments—for Life Members, \$100; for Patrons, \$1,000. Of the above amount, \$ is set aside each year to pay the subscription of each member to *CONSERVATION*.

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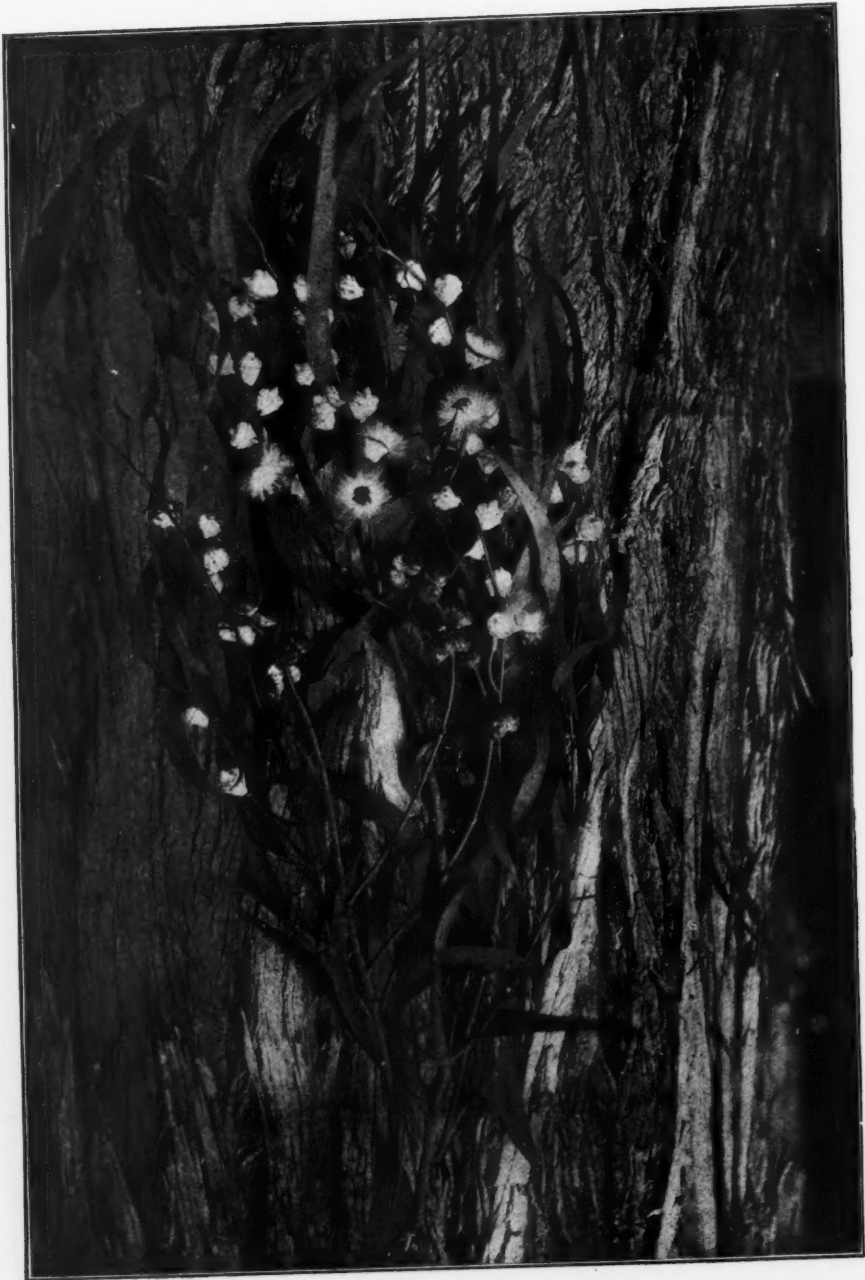
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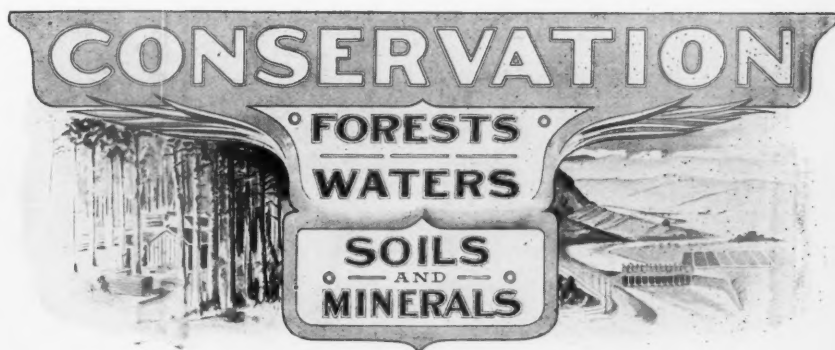
Very truly yours,

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Blue Gum (Eucalyptus) Showing Bark, Leaves and Flowers



Vol. XV

NOVEMBER, 1909

No. 11

How Our Forests Are Wasted, and Why the Need of Government Control

By S. T. KELSEY

ALL of the water upon the land surface of the earth comes in the form of rain or snow, and can doubtless be depended upon so long as the ocean endures and the sun shines.

Though certain as the sunshine, the rainfall is as variable and uncertain as the wind, and as uncontrollable by man's devices; but after it has fallen it is controlled and its effect upon the earth regulated by conditions for which man is largely responsible — conditions which he may direct and modify, but may not defy with impunity.

One condition is that the bare, loose covering of the earth, exposed to the falling rain, is sure to be washed from the higher levels into the valleys, the streams, and at last into the ocean below. And no practicable substitute has been found for the forest-covering that nature has provided for regulating the run-off of the water and protecting the earth's surface from disintegration, displacement, and ultimate barrenness.

We in America came into possession

of a land stored with the accumulated wealth of the ages. In our reckless haste for gain we are destroying more of this stored-up wealth in a single decade than any of the older people of the earth have done in a century.

But the direct destruction of our resources is not the worst feature of the case. The land was protected from erosion, practically everywhere. The greater portion was covered by dense forests that had formed a bed, or forest floor, of porous soil and decaying wood and leaves, all held in place by a mass of entangling roots, forming a sponge-like covering of the earth that absorbed the water in time of excessive rainfall and allowed it to percolate slowly through, furnishing a constant supply to moisten the earth and maintain the springs and streams.

To the early settlers the forest had no commercial value and must be cleared off the land to prepare it for growing crops.

The woods then were the greatest



Forest Covering* Provided by Nature to Regulate Run-off (Page 657)

obstacle in the way of settlement, and the prime object was to get rid of them in the quickest and cheapest manner.

They had no friends or protectors, and, besides the destruction from clearing, lumbering, and accidental burning, they were deliberately fired to improve the range for the settler's stock, to give the children and hogs a better chance to gather the chestnuts and acorns, to kill off the snakes, and, if there appeared no better reason, they were fired just for the fun of seeing them burn.

The early lumbering operations consisted in running over the country and taking only the best timber wherever it would pay for manufacture and transportation, and the forests were so extensive that the lumbermen, by ever seeking new fields for exploitation, could get the pick of the standing timber almost for the cutting.

Only the best timber in the best trees was taken; the rest of the forest was not considered worth preserving, and so what was cut and not taken was left

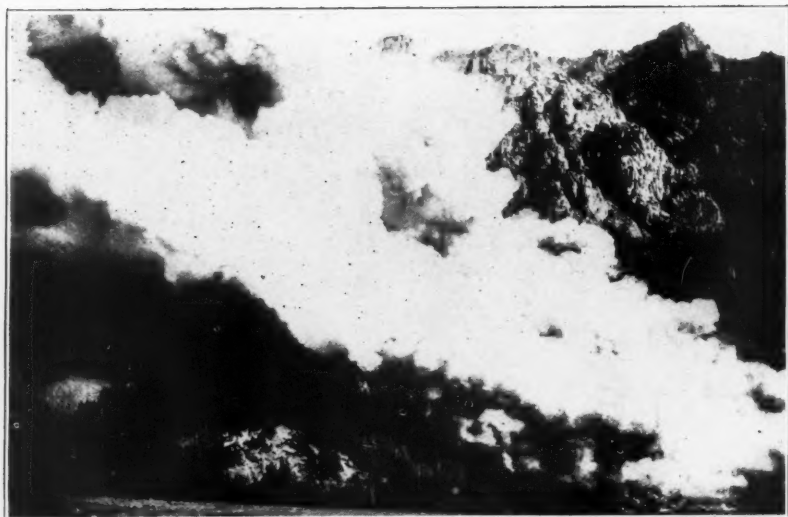


Sierra Forest Reserve, Illustrating Protective Covering (Page 657)

on the ground to feed the flames and increase the destruction from the next forest fire. And this common practise of cutting the best and burning the rest has been followed up until it has so far depleted and degraded the stand that our remaining forests, east of the Rocky Mountains contain but a small amount, probably less than one-fifth, of the valuable timber that they might have had with reasonable care and protection.

The repeated burnings have largely destroyed the forest floor that held back the water and protected both the mountain and the valley from destructive flood and drought, and robbed the soil of its ability to reproduce a protecting growth.

Formerly, the settlers selected the more level land for clearing, but, with the increasing demand and abandonment of the older, worn-out fields, they are now pushing their clearings up



Forests Were Once Deliberately Fired to Improve the Range (Page 658)

the steeper hill and mountain sides, which, in their turn, must necessarily soon be washed and worn to sterility.

The lumbermen first operated in the lowlands where the best timber grew and logging and transportation were cheapest and, cutting only a part of

the trees, they left a semblance of forest behind.

With the depletion of the lowland forests, they have moved up, through the foothills and into the mountains, and are now stripping the mountaintops and sides of whatever usable tim-



Fire Follows the Lumberman: White Pine Wreckage in Wisconsin (Page 661)



Stripping the Mountain Tops; White Mountain Scene

ber the settlers, the forest fires, and the sporadic lumbering had spared.

The cheaper grades are in demand, and nearly everything is cut down to seven or eight inch saplings; the brush and tops are, as heretofore, left upon the ground, and the fire that is sure to follow completes the work of destruction. And the damage is not confined to the cut-over lands; the fire, fed by the dry brush, becomes uncontrollable and spreads to adjoining lands, oft-times burning over large tracts of standing timber and destroying other property of many times the value of the lumber taken from the cut-over land.

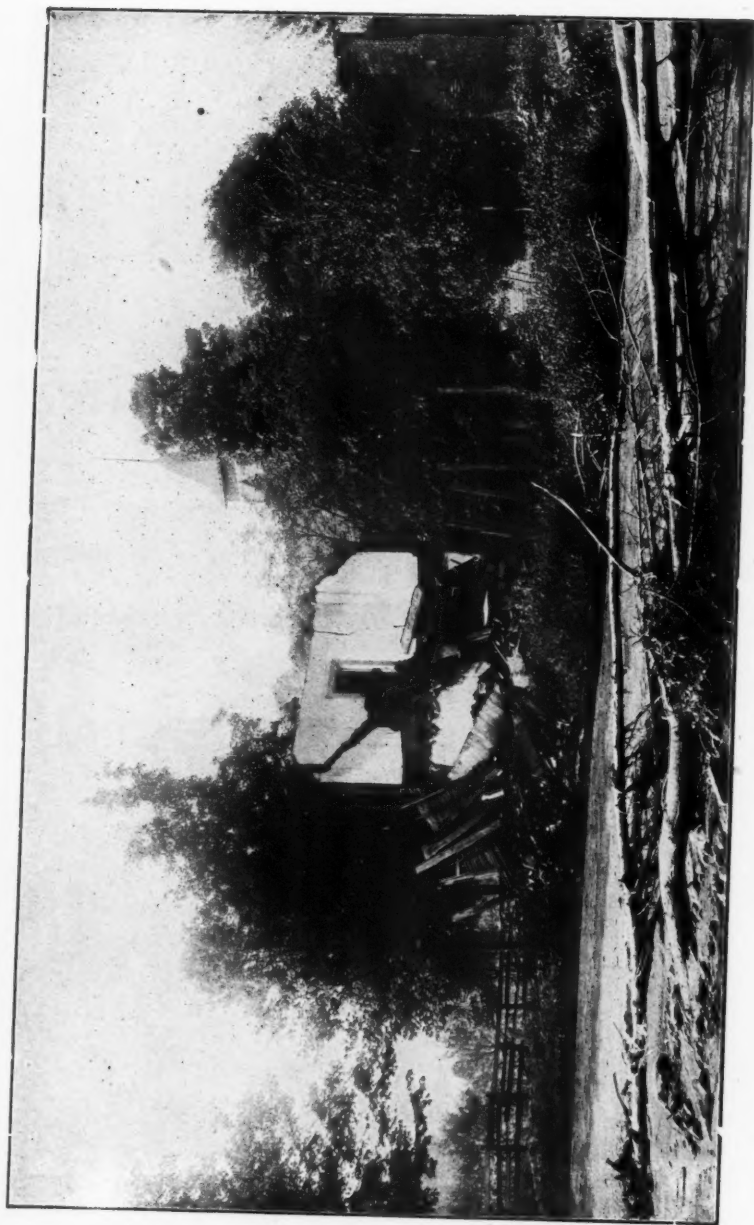
A few years more under the present mismanagement and our original forests will be gone; and even if we begin now to plant and grow for future use, we cannot provide a supply soon enough

to prevent a timber famine that will cripple almost every industry, affect every citizen, and be of incalculable loss to the country.

But the danger of loss from timber famine is small compared with the loss that is sure to follow the general destruction of the remaining mountain forests.

We are told that already "more than a thousand million tons of our richest soils are swept into the seas every year, clogging the rivers on the way and filling our harbors."

The waters from our melting snows and heavy rains rush swiftly down the denuded mountain sides, overflowing the creeks and rivers below, wrecking roads and railroads, dams and mills, and submerging farms, villages, and cities; many lives are lost and millions of property are gone. The water is



Flood Follows Deforestation: Scene Along Nolichucky River



Debris from Wreck of Sawmill and Log Boom on Linville River, by Floods, in Western North Carolina, in Region of Proposed National Forest Reserve

also gone. A few weeks of sunshine follow the flood and the papers report, "Unprecedented conditions of drought. Crops and stock perishing. Forest fires burning up a million a day. Mills and factories idle for want of water. Steamboats and barges stranded on the shoals. The small streams dry." And, "Boys playing ball in the middle of the Ohio River."¹

These conditions, the evident results from the rapid destruction of our forests, were foreseen and foretold by thoughtful people long ago. Such wise and patriotic citizens as Dr. John A. Warder, Robert Douglas, Wm. Cullen Bryant, and his brother, Arthur Bryant; Rev. Frederick Starr, and many others warned the country of impending danger, and efforts were made, immediately after the close of the war in 1865, to awaken an interest in favor of intelligent reform in forest management and to secure legislation, state and na-

tional, for encouragement of forest protection and extension.

But warnings were unheeded; stockmen and lumbermen preferred the free range of the plains and forests to any Government restrictions or supervision. They saw money in the grass and trees, and their object was to get it out as quickly and cheaply as possible; and so, between the general apathy of the community and the opposition of those immediately interested, little has been done to stay the rapid course of waste and coming want. The great white-pine and hardwood forests of the North have little left but culls and inferior grades.

At the present progress of cutting and burning, the timber supply of the Southern Appalachian Mountains, now almost our sole dependence for hardwood lumber, will be practically exhausted in from twelve to fifteen years, and the streamflow of the Mississippi,

¹Head-lines from a single copy of a New York tri-weekly paper of September, 1908.



Forest scene in the Southern Appalachian Region

the Ohio, and all of the important rivers of the East and South seriously affected.

It is generally observed that erosion on uncovered lands in the southern mountains is much more destructive than farther north, due probably in part to the winters' protection of snow on the northern lands and difference

in texture of the soil and underlying earth; but also largely to the use of the northern mountain lands for meadow and pasture, while the southern lands are more generally cultivated and tended in annual crops, so long as they will pay for cultivation. They are then abandoned to their fate. There are now millions of acres in all possible



Forest Destruction in Southern Appalachians

conditions of degradation, and millions more to follow.

When the Southern Appalachian Forest Park bill was first introduced into Congress there were large areas of the average of uncut timbered lands that could be bought for from \$1 to \$3 per acre. A commission was sent out to investigate, and its able report, backed by the President, recommended the passage of the bill. Everybody seemed to favor it; but when it apparently could have passed both houses of Congress, it was held up for some reason unknown to its friends outside; and it has been held up ever since.

Meanwhile, attention having been called, by official investigations and reports, to the rapid exhaustion and consequent prospective increase in price of the remaining timber, buyers from the older and largely exhausted lumber districts have overrun the ground, buying up whatever they thought could be

used, or, as we have heard some say, "sold to Uncle Sam at a good profit." And thus, while action has been delayed, most of the remaining Appalachian forests, of present and prospective value, have been bought up by lumbermen and speculators, and are now held at prices many times above what they would have cost when the Forest Park bill was first considered.

And now we are told that, "owing to the high price that would have to be paid for virgin forest land, but little of such land can be bought."

"It will be the wisest course under present conditions for the Government to purchase cut-over rather than virgin lands. Even cut-over lands with no prospect of a timber crop inside of ten or twenty years will cost as much now as virgin lands ready for the saw would have cost eight years ago. Barren and eroded lands, of which there is a greater area now, will cost no more to-day than

*See Report of the Secretary of Agriculture on the Southern Appalachian and White Mountain Water-sheds, 1908, pages 8 and 30.

in the past. But, considering the expense of planting the timber on them, and the time before returns can be secured, they become the most costly class of lands that can be purchased."

It appears, then, that efforts to secure Government aid for preservation of the Appalachian forests have so far had no practical results, except to make their destruction more rapid and certain and their rehabilitation more remote, difficult, and expensive, and it will require many years of active work, and expense without returns, to reproduce even as favorable forest conditions as existed "eight years ago."

In the West, where the Government owned the lands, large areas have been reserved within the last ten years for the preservation and extension of National Forests; but in the East, where private ownership controls, it certainly appears as if all efforts for the preservation of the forests have thus far accomplished *less than nothing*.

The Government spends hundreds of millions in dredging the rivers and harbors. And now it is proposed to dig a deep waterway from the Lakes to the Gulf, dredge out the rivers and build great reservation dams to regulate the streamflow and provide a national system of inland water transportation and water-power. It is a great scheme and its accomplishment greatly to be desired; but we are a great people, and the glamour of great undertakings is alluring.

We have already proved that if we shall say unto the mountain, "Be thou removed, and be thou cast into the sea; it shall be done," but we have not yet proved our ability to stop the mountain on its way, or prevent the destruction that its removal may cause. The reservation dams may, for a time, check the flood and delay the movement; but the delay will be but temporary, for, once started on its way, the detritus will fill up the reservation ponds, lakes, and river-beds, and finally reach the ocean harbors.

Therefore it is suggested that before undertaking the expenditure of two or three hundred million dollars on the Lakes-to-Gulf deep waterway, and a

thousand or two millions more reclaiming the remainder of our waterways, it might be well to consider the economy of beginning at the headwaters and eliminating the causes of decadence of our water-courses rather than burdening the country with the continuous expense of trying to undo the effects.

We know, of course, that the forest covering cannot control the water-flow altogether, but it is the best known regulator of the run-off and a nearly perfect protection against erosion; and, reinforced by the reservation dams to hold back the flood, would at least greatly reduce the cost of construction and maintenance of the deep waterways. And besides giving protection to the land and waterways, the forest will furnish material for useful employment of the water-powers, and commodities for transportation more valuable than mud and sand.

We are talking conservation, but little is yet being done to stop the needless, wasteful works of destruction.

We are reclaiming desert lands in the West, but we are making deserts much faster in the East. We are destroying more acres of forest every week than we are recreating in the whole year; and, while we are proposing a great national system of deep waterways, we are stripping our steep hill and mountain lands of their only protection against erosion and turning loose additional billions of tons to fill up the already clogged rivers and harbors.

We are despoiling the earth and wasting its resources as much faster than any people who have gone before us as the swift-running railroad train is faster than the slow-going pedestrian.

If present wasteful and destructive ways are continued we shall, in the near future, have little to export from the products of our forests, our fields, or our mines, and a dearth of the wherewithal to feed, clothe, and employ our own people, and will be facing questions of vastly greater consequence than the fixing of tariff schedules, building inter-ocean canals, or hunting open doors for our surplus commodities.



Dams Now Proposed to Regulate Streamflow. Dam Site on Lower Colorado (Page 666)

We can hardly blame the lumbermen more than operatives in other industries for past practise or present conditions. Like other people, they are in business for the profit, and too busy with the things of to-day to take thought for the morrow; and, with no authority to stay the work of destruction, competition has compelled them to adopt such practise as experience has shown to be necessary for success.

But it is evident that the short-sighted policy of private control cannot be trusted for protection of the common interests, and, if we would stay the work of destruction, we must provide some system of Government guardianship and supervision of the remaining forests.

Our authorities estimate the original forested area of the United States at 850,000,000 acres, and that clearing, cutting, and burning have reduced the acreage to 550,000,000.

Of this remaining so-called forest, 100,000,000 acres, an area as large as New York, New Jersey, Pennsylvania, Maryland, and Virginia, is said to be so damaged by cutting and burning

that its growth is of little value, while 250,000,000 acres partially cut and burned over are restocking naturally with sufficient young growth to produce a fair crop of timber. This leaves but 200,000,000 acres of uncultured forest, less than one-fourth the original forest area.

Of this amount there can hardly be over 50,000,000 acres of uncultured forest east of the Mississippi, and a considerable part of this has been left because, on account of its inferior quality or quantity, it has not been worth the cutting.

The 350,000,000 acres of culled and burned-over forest lands have been so persistently stripped of their best productions, and the least valuable left to grow and propagate their kind, that the natural reproduction is largely of undesirable and unprofitable growth; and though the estimates on the amount of standing timber, taking the lower grades into account, may be approximately correct, it is certain that some of our most valuable and indispensable woods for many important industries are already nearly exhausted.



Forests Cannot Wholly Control Waterflow; Reservoirs Afford Valuable Supplements.
A Reservoir at Hartford, Conn. (Page 666)

The German forests are producing four times as much annual growth per acre as ours and, while the Germans are stocking their forests with the most valuable trees, and improving the product, we are stripping our forests of whatever is worth the cutting and leaving the least valuable for future growth and forest renewal.

A few years more of such practise and, if one would get a good carriage, farm implement, or utensil of any kind made wholly or partly of wood, it may

become necessary to see that it is "made in Germany."

In Los Angeles, lately, I went through the yards and found considerable quantities of lumber imported from Japan and the Philippines, and was told by the dealers that, while nominally it cost the same as American lumber, they got a better quality for the same grade.

It was probably for the same reason that shiploads of railroad ties were coming into San Pedro, the port for Los Angeles, from across the Pacific.



We Are Reclaiming Desert Lands in the West. Nevada Lands Withdrawn from Entry (Page 666)

But we cannot long depend upon importing lumber of any grade; for with the general awakening of the nations, the world over, they are likely soon to want what they have for themselves.

In any case, it is useless to talk of importing our forest supplies. We must provide for them at home or practically do without, whatever the consequence.

We are told by some of our high and wise counselors that the United States, the only authority that can furnish efficient protection to our forests and streams, can adopt no general plan of control because it would be unconstitutional.

The country has never made a real advance movement without meeting this same objection, and, if such counsel had been heeded, the United States would have gone to pieces long ago; but fortunately, when unforeseen dangers threatened and new conditions required adjustment to meet new wants, we have had men directing the affairs of state wise and strong enough to use such available means as became necessary to safeguard the welfare of the Nation.

The people have sustained such action, and the "broken Constitution" has been, in some way, adjusted to the new situation; and when the people demand national supervision for our forests and streams, they can certainly find a way to *make* it constitutional.

The real dangers are from apathy and indifference of the people regarding the urgency of the case, and the greed of private interests that would deceive the country as to actual conditions, seek control of remaining resources, and continue the work of destruction.

Our Forest Service, with its thoroughly competent chief, able assistants, and intelligent foresters and rangers, is working out our various forest problems and demonstrating the best means for meeting present and future wants, as fast as the laws and means provided will permit, and can be depended upon for wise direction of whatever larger operations the country may undertake.

We have, then, the nucleus already established, and should be able to evolve some system of national control, under guidance and supervision of the Forest Service, that shall insure such protection, development, and perpetuation of our forest resources as may be necessary to safeguard the paramount and permanent interests of the whole country. Not necessarily Government ownership, but some system of cooperation by which, in consideration of aid and protection to state, local, or individual owners, the Government should receive a reasonable per cent on sales of the forest products.

If well managed, we believe there is land enough in the United States worth more for forest than for other purposes, much of it an idle waste, and, under present conditions, rapidly deteriorating, to provide for probable future necessities of the people.

A steady demand for forest material is quite certain to make the production profitable for the timber alone; while, as a regulator of the water-flow and protector of the lands, the forests are, by far, the most valuable asset of our destructible resources, and their proper care and preservation of vital importance.



THE FUNCTION OF THE FOREST*

By Dr. N. KAUMANN

Imperial German Agricultural Attache to the United States

IF IN my speech I do not touch some questions of importance to your interests, you may seek the reason for this in the fact that, only lately, your first authority on forestry has published a most thorough and able pamphlet in this direction, entitled, "What Forestry Has Done."

I am proud and at the same time glad to read in this pamphlet, what position Mr. Pinchot assigns to German forestry in the Union, and that is why I, too, gladly accepted your kind invitation to speak here about the importance of forestry in general.

If we wish to assign some reason for the great pleasure and interest Germans and peoples of Germanic race take in forests and things of the forest more than peoples of Latin stock, we must seek it in their character. From ancient times the Germans have regarded their groves with great veneration. Under the branches of trees still more ancient, our ancestors conducted the solemn ceremonies of their worship. The deities spoke to them in the rustling of the leaves and the creaking of the boughs. And to-day their descendants break out in song and jubilation amid leafy shades that centuries ago witnessed the solemn procession wend its way to the sacrificial altars.

The inhabitants of ancient India, also, venerated the forests as the special dwelling-place of their divinities, but the early Germans were, in a greater sense, children of the woods. They lived in the forests. The forests furnished them all the necessities of life, just as the wild beasts, particularly the bear, clothed them with their furs.

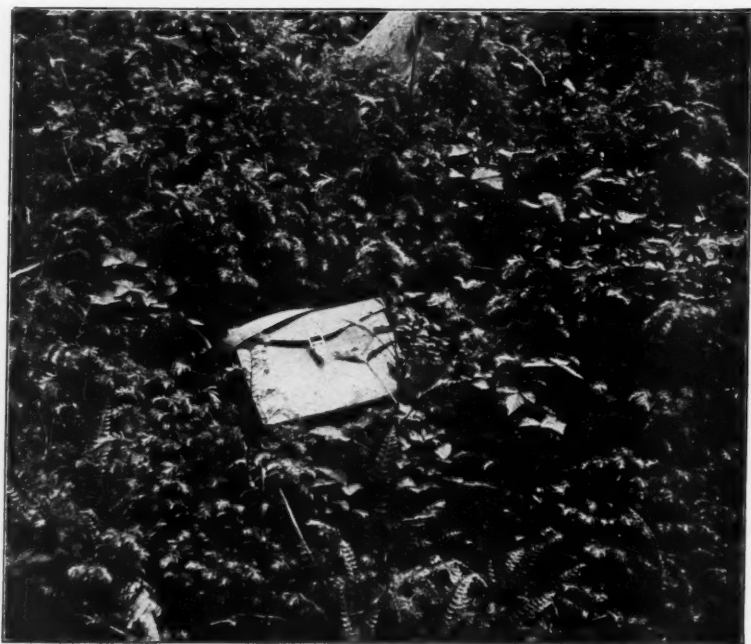
The wild bees, hanging their busy hives on the boughs, gave them honey, which, when mixed with the sap of the birch, made a wholesome beverage. Their huts were built of the wood of the trees about them; they warmed themselves at fires whose fagots came from the timber. Their weapons, particularly the long spear, were for the most part fashioned from the stoutest woods. Their religion was essentially a forest-cult, traces of which are still to be found in the inborn love and appreciation of their modern representatives for the beauties of the woodlands, their leafy solitudes, the music of the wind in the branches, the caroling of the birds in the lofty treetops and the soft murmurs of some half-hidden rill. "The God of the German dwelt not in the cold wealth of marble fane, nor in the echoing vastness of grand cathedrals, but mid the fresh groves of eternal oaks." Under these venerable trees the ancient German adored his gods, for there only, it seemed to him, could divinity properly dwell.

It is but natural that men who had been brought up in the close companionship of the forests should transmit to their offspring, through well-nigh countless generations, some of their deep regard for woodland beauty, antiquity and associations. But with this regard they associated due appreciation of the present economic value of their forests. The question of their preservation and distribution, so that all places may at all times derive their share of the benefits from them, is one of pressing importance. Aside from every consideration of the past, the

*Delivered before the National Irrigation Congress at Spokane, Wash., August, 1909.



• Dense Foliage Facilitates Exchange of Gases: White Pine Plantation (Page 673)



The Beauty of the Woodlands: Hemlock Seedlings (Page 671)



Forests an Important Factor in the Economy of Nature

forests, as producers of fuel and lumber, with all the uses to which these are put, to say nothing of by-products, are intimately connected with the welfare of men. Many of them live by working at trades either directly or indirectly dependent on them.

What position do the forests hold in the economy of nature, that is, in the relations and interworkings of what we may call its four primal factors—the animal, vegetable, and mineral kingdoms? These are closely connected with one another. For example, animal and vegetable life are especially interdependent, not only as regards the furnishing one to the other of the essentials of existence, but also in their relation to the atmosphere—a matter of great concern to man. It has often been shown

that the same carbonic acid gas which is destructive for animal life, is an essential for vegetable life. Plants need this gas to develop their organs, and in turn emit oxygen, which is equally vital to animals. All plants, but particularly areas of trees with their wealth of foliage, are instrumental in effecting this exchange of gases; hence, any discussion of the chemistry of the atmosphere has to take into account the great and real influence of the woodlands. A beech wood, which furnishes on one hectare $9\frac{1}{2}$ feet of wood in a year, will in this period throw off 51,567 cubic feet of oxygen, enough for the requirements, in that regard, of eight adults the same length of time. But while thus fitting the atmosphere for animal life, trees with their green leaves and branches bind the carbon of



Forests Absorb and Surrender Moisture: Typical Forest of Ohia Lehua in Region of Heavy Rainfall, Hawaii (Page 675)

the gas for use as fuel, starch, etc. Even this brief statement of facts goes to show that forests are an important factor in the economy of nature, contribut-

ing not only to the habitableness and beauty of the land, but also to the health, nay, to the very existence of its inhabitants.

A second function of great moment is the regulation of the temperature. They truly measure out rain and sunshine. They absorb the vast quantities of water that men do not use. Close observation has shown that a leaf of ordinary size can absorb about fifteen to forty-five grains of water in a day, and a leaf of larger dimensions sometimes even as much as a small pailfull. But where evaporation proceeds unhampered, warmth is held bound and cold produced. Forests, therefore, temper the heat, hinder radiation and so lessen also the amount of lost heat. This warmth, necessary for the process of evaporation, can only be taken from the atmosphere, the temperature of which is thereby lessened. A wooded region, then, slowly warms and cools by turns, and produces a corresponding change in the temperature of the neighborhood. The moisture acts as a cooling influence in evaporating, while the atmosphere and clouds hold their heat because radiation is in a large measure checked. The numberless vapor-laden leaves facilitate the formation of mist and dew. Their warm dampness assists in cloud building; while the whole wide area of vapor, inhaling and exhaling foliage at the top of the trees, holds them and the mists, to the decided advantage of the neighborhood. Thus, this process of cooling and evaporating, itself productive of rain and mist, in turn benefits the forests themselves and the neighboring fields and meadows. All the phenomena of the atmosphere work together to the great end of making possible the existence and well-being of earthly life.

The forests are, however, even in another sense essential to the natural organization of forces, as water-gatherers and distributors and spring-builders and feeders. We have seen how life on earth is dependent on air and water. Now, the forests absorb much moisture from the air and again surrender it freely. They retain a great part of the moisture collected in their locality, and so act as reservoirs for all atmospheric condensations. In this way they become the sources of numerous springs and

streams; prevent extremes of dampness and drought and keep the precipitation from flowing off too rapidly. The rain-drops falling on the leaves and trickling down the stems reach the ground with much less force. There, if not to a large extent immediately absorbed, the water is at least retarded in its flow, so that it gradually sinks into the real ground below (which is always kept open by the mass of dead leaves lying on it), whereas on a bare, sloping plane it flows off in large measure. The snows, too, melt more slowly under the influence of the milder conditions fostered by the protection of the trees, and penetrate into the ground, which for the same reason is seldom frozen hard beneath its blanket of grass and fallen foliage. These waters are slowly and constantly drained off to feed the springs, wells and rivulets. Men have often found the ordinary sources of their water-supply exhausted, because the mountain and hill-tops had been cleared of their woods, and that, too, at times when the water was most needed in the houses and on the farms. This also explains why after a heavy rainfall the water may be so murky as to be entirely unfit for use. There are no cheaper, better and more sanitary water reservoirs than the forests. Artificial water reservoirs in the shape of ponds or produced by dams can never equal them because their capacities are limited, their contents may be diminished by evaporation and may become poorer in quality as the drouth proceeds. The water that is drawn from the bare floor of such a reservoir into the pipes for daily consumption is often contaminated, and entirely lacking in refreshing carbonates. Ponds and reservoirs must, indeed, be constructed where the forest lands have been cleared, but they are at best only make-shifts.

That many regions may be made unproductive and even uninhabitable because of the destruction of their woodlands is evident from what has been said. Persia, once the most productive and prosperous of lands, is now nearly all a desert; it is only with grave dan-



Snows Melt More Slowly Under Influence of Forest Conditions: Michigan White Pine Forest Scene in Winter (Page 675)



We Should Transmit Our Woods and Waters, in Unimpaired Beauty and Usefulness, to Our Children (Page 676)

ger of starvation that one travels to the ruins of the world's proudest cities: Susa, Babylon and Persepolis. Sicily, in ancient times the granary of Italy, has now large stretches of stony waste instead of luxuriant groves on its mountain-sides, and every rain washes the moraine into the valleys below. In the southern part of Italy, heavy rains have injured the productivity of the fields by fully ten per cent. In the Tyrol, too, at least one-third of the area under cultivation a century ago is now waste land. The same is the case in Spain, Portugal, Greece, Iceland, Ireland—all have suffered in point of productivity because of the loss of their forests.

Forests, moreover, are important for sanitary reasons. Swamps and morasses, which breed disease by their miasmatic dampness, are dried up through their influence.

If we are to further national prosperity by the development of industries, it is also to our interest to transmit the forests, the legacies we have received from our fathers, to our children in unimpaired beauty and usefulness. Therefore, it is a matter of national concern that your forests should be protected. The effects of wholesale and unreasonable exploitation by private concerns are often farreaching; the springs are dried up, a drought ensues and not infrequently high winds result. Fields and meadows need water, and in considerable quantities, but it is of benefit only when the supply is slow and steady. Heavy rains flow off, for the most part, and if the area is an open stretch they can supply no springs because there is no vapor nor constant passage of moisture in such places. The forests, however, with their dense foliage, furnish protection and the necessary barrier for precipitations without which it would be well-nigh impossible to make any successful settlement. With the passing of forests, we have shown, disappeared prosperity, and whole regions have become wild and barren. The waters rush from bare mountain-sides, after a heavy rainfall,

down into the valleys, working destruction on the farmers' fields and pastures. But the torrents are absorbed and retarded and transformed into refreshing springs and profitable rills where the high places are covered with trees.

Again, while woodless flats hardly condense the clouds blown over them by favorable winds, and so do not perform their work of refreshment and re-vivification, wooded districts attract every wandering cloud and make it yield a gentle shower. The influence of forests on the rainfall of a region is expressed also in the fact that they render the climate more equable. The warmth which is received by them through the day and held because of their moisture pours out on the fields at night, relieving their coolness. So, also, do they mitigate the heat of the day, for they emit much of their vapor then, which serves to cool off the air and often raises a refreshing breeze. They attract the mist and the dew, whose cooling moisture it again turns into rain. In woodless districts heavy rains may fall, but seldom for any length of time, and then they are usually followed by a long dry spell. The woods, too, break the force of storms, cloudbursts and hail. Wooded eminences act like a wall against hurricanes and violent winds. The torrents of cloudbursts are arrested by them. Passing over them, violent rain and hail storms are tempered and so lose their force when blowing over the adjacent cultivated areas.

Our discussion would be almost indefinitely prolonged were we to consider forests in their disinfecting and air-clearing functions, their prevention of epidemics and contagious diseases. These functions are of the greatest importance to men. We are keeping entirely within the bounds of truth when we say that, in the destruction of the forests, humanity loses one of the necessities of life. Therefore, you should always look carefully after the preservation and propagation of your forests.

RESERVOIRS ON CHIPPEWA RIVER

By Hon. THAD C. POUND

THE prevailing ignorance regarding the work already undertaken by the Government and information submitted to Congress prompts me to present to the public some significant facts and conclusions respecting the subject of reservoirs.

Thirty years have elapsed since Congress asked the War Department to investigate and report upon the practicability and cost of reservoirs to improve the navigation of the Mississippi River and its navigable tributaries. The reports of such investigation, by extended surveys, examinations, and expert calculations of the engineering bureau, have been submitted to Congress from time to time, and some valuable work on the headwaters of the Mississippi River has been done. But this all-important subject has been in the main strangely neglected. The wonderful awakening of the entire Nation respecting our great natural resources, and the importance of their conservation and utilization, invite the fullest available information regarding our natural waterways, and the best means of their improvement for the various uses which they may subserve, among the most important of which are navigation and water-power.

It chanced that the first step to be taken, the creation of an extensive system of reservoirs, will accomplish a purpose of immeasurable utility, namely, the prevention of disaster resulting from destructive floods. This alone would justify the expenditure required

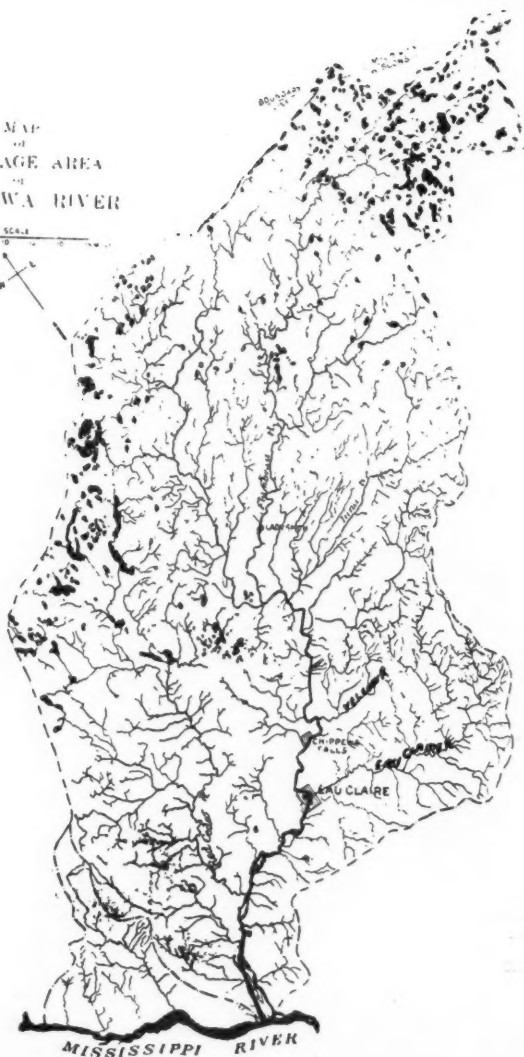
for fully carrying into effect the system. To make clear the feasibility, economy, and efficiency of the reservoir system in the prosecution of this great work is the purpose of this article. In order to present with brevity the significant facts involved, I shall take as an example the Chippewa River, in the state of Wisconsin, and submit summarily the conclusions relating to it to be found in the reports of the War Department. It is doubtful if there exist on the continent or anywhere else conditions so unique, extensive, and complete in every detail as are found upon the headwaters of the Chippewa River, in Wisconsin, for the accomplishment and maintenance of results proposed by the reservoir system, to wit, the prevention of disastrous floods, facilitation of water-power, and the promotion of navigation. The total drainage area of this river and tributaries is 9,573 square miles, its course extending from its source to its junction with the Mississippi River, being 267 miles, and its volume being supplied by more than 100 lakes, large and small, and countless springs. In the annual report of Maj. Chas. J. Allen for the year 1880 will be found, under the head of "Examination and Surveys at Headwaters of Saint Croix, Chippewa, and Wisconsin Rivers," the following relating to the Chippewa River, abbreviated:

The report states that twelve eligible sites for dams were found, the first being upon the Manitowish River at the outlet of Red Lake; proposed dam, fif-

NOTE.—This article, by the Hon. Thad C. Pound, of Chippewa Falls, Wis., is intended to supplement an article by the same author published in *CONSERVATION* for December, 1908. The former article gives the origin and progress of the reservoir system, designed to restrain floods and improve river navigation, the initial step for which was taken in the year 1877 by Mr. Pound, then a member of Congress from Wisconsin. The facts are of vital interest.

MAP
of
DRAINAGE AREA
of
CHIPPEWA RIVER

SCALE



teen feet in height and 250 in length; resulting reservoir capacity, 1,840,000,000 cubic feet, corresponding to 236.62 cubic feet per second for ninety days; surplus supply, 184,615,360 cubic feet, to be retained in Bear Creek Reservoir; cost of construction, \$7,615; calculation of results in this and all cases based on an average annual rainfall of thirty inches, with the impounding of one-quarter of the precipitation.

It is well here to observe that the low-water period during the open season is calculated to average "ninety days."

Second site, on Bear Creek, ten miles below the outlet of Flambeau Lakes; dam, fifteen feet in height and 2,500 feet in length; reservoir capacity, 5,401,567,152 cubic feet; cost, \$47,000. The supply from these two reservoirs will insure 552.81 cubic feet per second for a period of ninety days.

Third site below Park Lake, on Turtle River; dam, fifteen feet high and 296 long; reservoir capacity, 120,782,720 cubic feet, yielding 79.83 cubic feet per second for ninety days; cost, \$9,941.

Fourth site, at outlet of Butternut Lake, a dam ten feet high and 331 feet long gives a reservoir capacity of 585,446,400 cubic feet, yielding 75.71 cubic feet flowage per second for ninety days; cost, \$5,216.

Fifth site, at outlet of Round Lake, on the Upper Flambeau, a dam ten feet high and 170 feet long will produce a reservoir with a capacity of 1,353,031,416 cubic feet, yielding 135.93 cubic feet flowage per second for ninety days; cost, \$10,550.

Sixth site, about two miles below the outlet of Squaw Lake; a dam nine feet high and 280 feet long gives a reservoir of 731,808,000 cubic feet; cost, \$4,000.

Seventh site, below outlet of Bear Lake east fork of the Chippewa River; a dam nineteen and one-half feet high, 1,015 feet long, creates a reservoir of 1,114,148,851 cubic feet capacity, with surplus supply of 3,147,009,144 cubic feet of water, and yielding 143.15 cubic feet flowage per second for ninety days; cost, \$25,925.

Eighth site, at Little Chief Lake, east fork of the Chippewa; a dam twenty-four feet high and 710 feet long will create a reservoir with capacity of 771,332,000 cubic feet; surplus supply, 232,290,391 cubic feet of water; cost, \$40,702.

Ninth site, at the outlet of Moose Lake, west fork; a dam twenty-seven feet high and 1,235 feet long creates a reservoir with 2,021,783,402 cubic feet capacity, with surplus supply 1,712,179,798 cubic feet, giving an average flowage of 271 cubic feet of water for ninety days; cost, \$45,090.

Tenth site, below Pakwewang Lake, west fork of Chippewa River, a dam twenty-three feet high and 840 feet long will create a reservoir with a capacity of 6,193,132,598 cubic feet, portion of supply to be drawn through Moose Lake surplus, affording a flowage of 791½

cubic feet of water per second for ninety day; the cost of this dam, \$55,511.70.

Eleventh site, at Lac Courtes Oreilles; a dam five feet high and 260 feet long will produce a reservoir of 1,981,331,000 cubic feet capacity, furnishing flowage of 255.44 cubic feet of water per second for ninety days.

Twelfth site, on the Chippewa River, below the mouth of Paint Creek; a dam twenty-two feet high, 620 feet long, will create a reservoir with capacity of 508,336,720 cubic feet, to cost \$60,000.

The foregoing, summarized from Major Allen's report of 1880, shows the result of an incomplete survey and examination of the Chippewa River and branches above the city of Chippewa Falls. It may be safely stated that a complete examination would result in the discovery of eligible sites for reservoirs equaling in capacity the above-described. It is significant to note further that two large tributaries flowing into the Chippewa below Chippewa Falls, to wit, the Eau Claire and Red Cedar, are omitted, the improvement of which would be more valuable to navigation from Eau Claire City to the Mississippi.

Summing up the results of this incomplete examination, the major states that, as a result of the reservoirs named, "2,800 cubic feet per second for ninety days would be added to the normal low-water discharges of the stream." The low-water discharge of the Chippewa River at the mouth or at the jetties may be taken at about 2,600 cubic feet per second and about 3,400 cubic feet above the entrance of Beef Slough. (Beef Slough is now closed, adding 800 cubic feet at the mouth of the river.) When 4,000 cubic feet per second pass through the jetties good navigation obtains from the mouth to Eau Claire. Adding the increase (2,800 cubic feet) to the 2,600 cubic feet at the mouth, we have at least 5,400 cubic feet for ninety days, or 1,400 cubic feet more than absolutely required for purposes of navigation. To these may be added 800 cubic feet formerly diverted through Beef Slough.

That the Chippewa River is by nature a navigable stream is evidenced by the fact that from the earliest settlement of the valley it was navigated by many steamboats as far as Eau Claire; and, less frequently, to Chippewa Falls, until its valuable use for such purpose was suspended by the exclusive control of logging and lumbering interests for the driving and storage of logs. Happily for the public good, the driving of logs has ceased below Chippewa Falls; and all interests may be subserved by the employment, by the Government, of effective means of improvement for navigation, the facilitation of water-power, and restraint of floods.

What is true of the Chippewa is also true of the Wisconsin and St. Croix rivers in Wisconsin. With the improvement of these rivers as proposed, the Mississippi River will derive a benefit which will insure a six-foot channel from St. Paul to Dubuque, where it will be supplemented by other methods of improvement; and the cost of all methods for the entire navigable stretch of these tributaries and the Mississippi be reduced fully four-fifths by the stability of channels and the checking of erosion from the banks.

The magnitude and importance of this great work cannot be overstated.

When such uniform flow from the Chippewa River shall have been secured, a great benefit to the navigation of the Mississippi will be insured. When supplemented by a like flowage from the St. Croix and Wisconsin rivers, a low-water channel of at least six feet will be maintained in the Father of Waters, and the cost of improvements under present methods will be reduced fully four-fifths.

The incalculable benefits to navigation and water-powers and the restraining of floods are certain to be realized. The duty of Congress to provide for the earliest accomplishment of the great work is clearly manifest. That the engineer bureau is in full accord with the system is shown by reports on file in the War Department.

When theories prove to be practicable and valuable, action should not be delayed. That the management and operation of the reservoir system by the Government officials may not satisfy all private interests involved may be conceded; but may we not more safely trust the Government, which has full authority in the premises, than to yield control to private individuals or corporations who are expected to serve their own interests regardless of the public weal?



Yuma Dam Site, Colorado River, Right Abutment, California

PEOPLE'S RIGHT TO RUNNING WATER

By HARRISON WILLIAMS, Spokane, Wash.

IT IS quite safe to assume that, in the absence of any Government interposition or restriction, combinations of capital would monopolize the greater water-powers of the country, especially the enormous unimproved water-powers on the public domain; and those properties would, as a rule, be capitalized as high as steam-power competition admits. How and to what extent would the people, considered as a political and social unit, be affected by such monopoly control, and its incident capitalization? That is the question of the hour.

Examination of a large amount of available data will, I believe, establish an average ratio of the cost of steam-power to that of water-power at not less than three to one. Assuming that ratio; to capitalize as above would be to capitalize at three times as much as the actual investment; so it will be seen that two-thirds of such capitalization would consist of something which is not investment. This something is simply the usufruct of running water; nothing else is discernible in it. But running water is Nature's gift, wholly apart from anything that man has done, and of such a nature that it cannot be set apart as property (proper to a person), nor can its usufruct rightfully be capitalized by individuals or corporations for profit.

This usufruct element is the people's rightful, equitable interest in running water when used for power. It would seem to be a self-evident proposition that only the earnings of capital should inure to capital and that the benefits of Nature's endowments should inure to the community, the people as a social unit; inure in the way of cheap motive power, cheap electricity, and in kindred ways, not in the way of a revenue

to replenish the national treasury—regarded with alarm by the reactionists; though even that were incomparably better than that it should materialize in swollen fortunes.

Water-power trusts having the benefit of two dollars of Nature's gift to one of their own contributions, and in a field so vast as a water-power monopoly would provide, would inevitably beget swollen fortunes exceeding that monstrous progeny of Standard Oil.

To get a good perspective of the magnitude of the people's stake in this problem, let us consider a single stream. The Pend Oreille River, in the panhandle of Idaho and northeastern Washington, has a potential capacity which could not be duplicated by steam-power for less than \$35,000,000 a year, in support of which allegation I submit the following data:

Water-supply and Irrigation Paper No. 135, United States Geological Survey, gives the average rate of discharge of that stream for the year 1904 at 28,130 second-feet. But that is not all "commercially" available for power, as there is not available reservoir capacity to hold back but a small part of the water of the freshet season; and it is not practicable to equip for a stage beyond that which can be maintained for a considerable portion of the twelve months. To illustrate: The maximum rate of flow in May, 1904, was 92,000 second-feet, and the average for the month was 74,540 second-feet. For June, the rates were 93,000 and 85,040 second-feet, respectively, while the average for the seven lowest-water months was but 10,756 second-feet.

Calculations based upon the best obtainable data show a reservoir capacity which will give an average rate of 7,600 second-feet during the above

seven months. I estimate, however, that half of the reservoir capacity goes to make up the seven months' rate of 10,756 second-feet, leaving 3,800 second-feet to be added to the ordinary seven months' rate, making 14,556 second-feet available for power—a little more than half of the total run-off of the stream.

The fall of the Pend Oreille in its entire course—mostly in a few miles of it—is 750 feet. Reckoning on the basis of eighty per cent of the theoretical for useful effect, we get a result of 992,454 horsepower, of which 259,090 horsepower goes to the credit of the reservoirs, Flathead, Pend Oreille and Priest lakes.

A writer in a technical journal a few years ago stated the cost of steam-power for operating the New England cotton mills, where up-to-date engines were employed, at \$36 per horsepower year. That would make the cost of the above amount of power produced by steam \$35,728,344 a year.

As much power may be had from the surplus water a considerable part of the other five months as it may be found practicable to install plants to utilize. So much for one stream; a large one, however, known locally as "The Mighty Pend Oreille." But there are other streams which, together with the Pend Oreille, have an aggregate capacity of 2,000,000 horsepower, in an area of 30,000 square miles of the Spokane country. The foregoing large figures will indicate the enormous stake the people have to gain or lose in the controversy which is agitating the country.

There need be no apprehension that there will not be capital for investment in the improvement and utilization of water-power for good profits on the capital actually invested. When there shall be a fair understanding as to what belongs to capital and what belongs to the people, and the people find themselves in a position to command what belongs to them, there will be a general disposition to be liberal with capital. In fact, the almost universal custom has been to be too liberal. But, as every

user of water for power is using an element which is not the separate property of such user—an element which, in fact, does not possess the property nature—the Government has the right to know what the actual investment is. But the Government's control must be exercised in a common-sense way, as is suggested, for instance, by the legal maxim that "the law does not concern itself with trifles."

But if the foregoing reasoning is sound—and I think the more it is considered the more generally it will be approved—it follows that all water-power, improved and unimproved, whether on the public domain or elsewhere, is subject to the people's equity, for the usufruct doctrine is the announcement of a fundamental principle. The people's equity is inalienable. It would be a serious matter if the Government's control related only to water-power hereafter to be improved in the public domain, or on navigable streams. If such were the case, it would be only a question of time when the Government would have to take over the water-powers and operate them for the common good, for it may as well be understood that the predatory exploitation of the Nation's resources, those resources which are peculiarly Nature's gift, has to cease. The effect of such exploitation is to create and foster a plutocratic class, whose millions are the result of diverting, not the water, but its usufruct, from the people to whom it rightfully belongs to themselves.

Now, holding this usufruct element to be inalienable, there are important reasons for reserving water-power and reservoir sites from the acquisition of private title. One of these is that the Government can maintain its control better by having the title to itself. More important is that if the title to the land is in the Government it cannot be capitalized to participate in dividends.

The Government can enable a community to realize its equity by fixing horsepower rates. The power to fix rates was found to be the key to the solution of the railroad-merger prob-

lem. The Northern Securities Company was dissolved, but the merger still exists as a fact. And there are other railroad combinations which are virtually mergers—through the great financial institutions. The fact is, such combinations are not evils in themselves.

Combination promotes economy and efficiency. It prevents waste of economic energy, and as such it is a good thing. But monopoly is the perversion of a

good thing, which the Government seeks to prevent without sacrifice. In the case of railroads and water-power, fixing rates appears to be the best way to accomplish these results, and it would seem that these results could be accomplished with greater facility in the case of water-power than of railroads.

Regarding the question of jurisdiction—whether state or Federal—the usufruct doctrine can be applied with equal facility under either jurisdiction.

SUGGESTION FOR THE CONSERVATION OF PETROLEUM

By ROSWELL H. JOHNSON

THE strong appeal that ex-President Roosevelt's efforts for the conservation of natural resources have made is surprising and significant. That the Nation will henceforth judge legislation and executive orders largely from this standpoint is assured. It is rather remarkable, therefore, that the greatest influence to-day making for the needless overproduction of petroleum is the lease form which the Department of the Interior, under Mr. Roosevelt, has forced upon those operators who leased from the Indians.

The business of producing oil is naturally one of rapid growth, because of the large prizes which follow success and the relatively small amount of capital which is necessary to engage in it. In this respect it resembles the mining of gold in contrast to the mining of other metals. When, therefore, governmental regulation adds to this a legal stimulus to oil-production, the conservation of petroleum suffers severely.

In the oil fields off the reservation it is customary to charge an annual rental upon leased lands until a well is drilled, when a royalty on the oil produced is paid. But when an operator leases from an Indian, the Indian Office forces him to pay \$1.15 an acre a year the first

two years; \$1.30 an acre a year the second two years, and \$1.75 an acre the fifth year until he drills; and if he fails to drill in five years, to lose the lease. The effect of these provisions is obvious. It forces operators to drill in spite of overproduction. It prematurely tests large areas of land, and brings into development pools which would otherwise lie reserved for years.

The demand of some rental for every year that a well is not drilled is an old feature of oil leases which should stand, but the automatic enlargement of this payment from year to year and the limitation of five years are wholly unnecessary and work a great disadvantage to the Nation.

It might be said that the department must look after the interests of the Indian first, even though the welfare of the Nation suffers; but the Indians collectively would probably receive more money from a flat rental with no time restriction, because of the larger number of leases which would be so carried on Indian lands, and because the oil coming on the market in response to its normal demands would bring a better price than when produced without effective demand, as at present.

THE WESTERN PHOSPHATE LANDS

By MORSE S. DUFFIELD, Utah

IN THE inventory of resources reported by the National Conservation Commission it was stated that at the present rate of use and waste the supplies of phosphate rock would be consumed within twenty-five years; and on December 10, 1908, President Roosevelt withdrew from entry certain public lands in Utah, Idaho, and Wyoming supposed to contain phosphate.

That his course was wise seems evident from facts adduced by the commission. In 1890 there were mined 510,488 tons of phosphate rock in the United States; in 1907, 2,265,000, and of this amount 1,018,212 tons, or about forty-five per cent were exported. The rapid rate of increase in the domestic use of phosphate, taken in connection with the limited supply, causes serious enough concern, but what called forth the most vigorous protest is the exportation of nearly half the product.

President Van Hise, of the University of Wisconsin, is authority for the statement that it has been shown, as the result of agricultural experiment station work in Wisconsin, Ohio, and Illinois, that in fifty-four years certain cropped soils of these states have been depleted of one-third of their original phosphoric acid—1,080 pounds, or twenty pounds per annum per acre. The Geological Survey says: "Applying this rate of exhaustion to the 400,000,000 acres of cropped land in the United States, it would require 12,000,000 tons of phosphate rock annually just to offset this loss, or as much as the total amount that has been mined from the Florida deposits. The phosphate rock of North Carolina is nearly exhausted, and the Florida deposits—once popularly considered practically inexhaustible—have reached their max-

imum production and will soon begin to decline. Tennessee has comparatively large deposits, but this field alone would, at the present rapid rate of increase, last, according to the geologists, only eleven years. There is some phosphate rock in Arkansas, but it is of low grade. The large deposits of the public-land states must furnish the most of the phosphate of the future."

In the light of these facts, the withdrawal of phosphate lands as an emergency measure was ordered by President Roosevelt, pending action by Congress. And it is to be regretted that bills now before Congress tend directly toward anything but conservation. Senator Smoot's bill merely suggests investigation and is mainly tentative in character; but the other two bills—one by Senator Flint of California, and the other by Mr. Mondell of Wyoming—are designed primarily to cure past litigation in the field, and do not have in view the conservation of the deposits. Of these two bills, Mr. Mondell's is the worse from the point of view of conservation. And the attention of the friends of this country's resources should be called to this question.

To begin with, Mr. Mondell's bill is dated May 13, 1908, and hence could not have been designed for the conservation of the deposits, because the phosphate lands were not withdrawn until December 10, 1908; on the contrary, it bears strong internal evidence of having been designed on behalf of litigants in the phosphate field. It provides that locations made either under the placer act or under the lode act, prior to the withdrawal of the lands, shall hold according to their priority, irrespective of whether the land was placer or lode—according to the Fed-

eral Statutes at the time of location. It further provides that where locations were made under the lode act such locations shall have no apex or extralateral rights (the right to follow the dip of the vein under the side lines). Besides these provisions, which are aimed to affect certain litigation now in the Federal courts, and are of doubtful constitutionality, it provides for the location, hereafter, of the lands under the placer laws.

To understand the significance this holds for the friends of conservation, it is necessary to understand the difference between lodes and placers. This is a distinction not widely known in the East, and, hence, not given its due importance in the consideration of this bill. Under the placer laws, locations are made on valuable mineral deposits—not "in place"—that is, *alluvial*. In Florida, most of the phosphate deposits are *placers*; i. e., they are a phosphate gravel in river-beds and under more or less overburden, but not enclosed in bedrock.

Under the lode law, locations are made on valuable mineral deposits, lead, copper, asphaltum, gilsonite, etc.—"*in rock in place*"—that is, being in veins having well defined walls and a well defined outcrop.

From the staking of phosphate deposits in this western field under these different acts there has resulted much confusion, and several such conflicts are now in the Federal courts. The lode locators outnumber the placer locators, but the latter are mainly powerful corporations (one in particular, the Mountain Copper Company of London) being active on behalf of legislation favorable to the placer claimants, and if this legislation is passed its constitutionality will no doubt be tested in the courts.

The question naturally arises, Where does the theory of conservation come in? Under either the placer or the lode act, if there is no limit to the number of placer claims or the number of lode claims one may acquire, the deposits will be taken up *in toto* sooner or later, and probably at no distant date.

To consider the question better, let us examine the placer law briefly. By using seven names or powers-of-attorney other than his own, a locator can claim, under this act, 160 acres, making but one discovery and placing only four stakes in the ground. Upon the expenditure of \$500 in development and the payment of \$2.50 per acre to the United States, he can patent his claim of 160 acres. In other words, the land costs him, under the placer act, \$900 for 160 acres, or \$5.625 per acre. Where the phosphate vein is nearly vertical he can, under the ten-acre subdivision regulation of the placer law, stretch his claim out along the outcrop of the vein, so as to embrace the equivalent of nearly eight lodes, or perhaps more, according to the contour of the outcrop. Where the phosphate dips between thirty degrees to forty degrees, he can widen his claim so as to control the dip of the vein to all practicable depths of mining. He has this great choice, and his land costs him only \$5.625 per acre to patent—less than its grazing value.

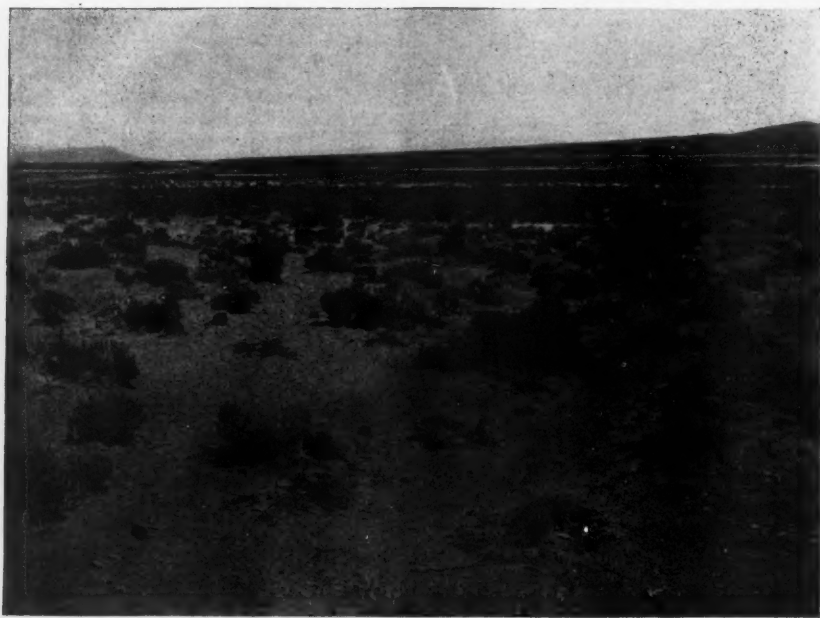
And now let us see what the lode locator must do. He is restricted to 1,500 feet along the outcrop of the vein and 300 feet on either side of it—only twenty acres in all to one location. He must spend \$500 in development and then pay \$5 per acre (twice what the placer locator pays) to the Federal Government—i. e., \$600 for twenty acres, or at the rate of \$30 per acre. To be sure, to offset this he gets the right to follow the "dips, spurs, and angles" of his vein; but when the dip is very steep, his surface rights extend only to his side lines, and in such case he has scarcely any advantage over the placer locator, who can regulate the shape of his claim at will.

As stated above, there has been no limit nor is there any suggested to the number of claims a man may take under either the placer or the lode laws, and the western phosphate deposits cannot be conserved to the American people by allowing unrestricted action under either law. But to place the pre-emption of these deposits under the

placer laws (to say nothing of the retroactive and unconstitutional infringements on the rights of existent lode claimants that this bill contains) places the phosphate deposits at the disposal of locators at a price less than the grazing value attaching to adjoining land. The sheepmen will hunt up enough phosphate to constitute a legal "discovery," and then patent whole quarter-sections at \$5.625 per acre. In that way the sheepmen will get valuable summer

range with the phosphate deposits "thrown into the bargain."

Such promises to be the result of the legislation thus far proposed since the President's withdrawal of the deposits from entry. It will cause a rapid location of the entire field that would not otherwise have been expected. The irony of such attempts at conservation is in line with the familiar story of the loss of the rest of our natural resources.



View Showing a Stretch of Irrigable Lands That Have Been Filed Upon and Homesteaded Under the Main Truckee Canal Nevada; Five Miles Southeast of Wadsworth, Nev.

THEODORE ROOSEVELT

Dynamic Geographer

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

(Continued)

RECLAMATION

OUT of this work, and alongside this work, has been developed, and is being developed, the great national undertaking known as the "Reclamation Service," which has already made vast contributions to the prosperity of sixteen states and territories.

President Roosevelt is the first President who ever mentioned the subject of irrigation in a message to Congress. This work is as much his own as any such work can be said to be the work of any one man. In his first message to Congress, after referring to the effects of forests on water-supply, he said: "The forests alone, however, cannot fully regulate and conserve the waters of the arid regions. Great storage works are necessary to equalize the flow of the streams and to save the flood waters. Their construction has been conclusively shown to be an undertaking too vast for private effort. Nor can it be best accomplished by the individual states acting alone.

"Far-reaching interstate problems are involved, and the resources of single states would often be inadequate. It is properly a national function, at least in some of its features. It is as right for the National Government to make the streams and rivers of the arid regions useful by engineering works for water storage, as to make useful the rivers and harbors of the humid regions by engineering works of another kind. The storing of the floods in reservoirs at the headwaters of our rivers is but an enlargement of our present

policy of river control, under which levees are built on the lower reaches of the same streams.

"The Government should construct and maintain these reservoirs as it does other public works. Where their purpose is to regulate the flow of streams, the water should be turned freely into the channels in the dry season, to take the same course under the same laws as the natural flow.

"The reclamation of the unsettled arid public lands presents a different problem. Here it is not enough to regulate the flow of streams. The object of the Government is to dispose of the land to settlers who will build homes upon it. To accomplish the object, water must be brought within their reach.

"The reclamation and settlement of the arid lands will enrich every portion of our country, just as the settlement of the Ohio and Mississippi valleys brought prosperity to the Atlantic States. The increased demand for manufactured articles will stimulate industrial production, while wider home markets and the trade of Asia will consume the larger food supplies and effectually prevent western competition with eastern agriculture. Indeed, the products of irrigation will be consumed chiefly in upbuilding local centers of mining and other industries, which would otherwise not come into existence at all. *Our people as a whole will profit, for successful home-making is but another name for the upbuilding of the Nation.*" (December, 1901.)

This is no place for even an outline of the history of conservation, but it

is well to note that irrigation has been practised in Egypt, India, Mexico, and many other lands for long periods of time. It is a proud heritage for any race that wherever their flag has gone, there, constructive and scientific work has arisen for the benefit of the peoples who had, from time immemorial, been subject to flood, drought, famine, plague. When was there ever so propitious a day for Egypt and the Sudan as when the British flag was planted there, with British engineering skill and British millions of pounds sterling? The dams and canals, channels and barges already finished, with the new ones planned, have brought a prosperity and a peace to the North of Africa which never has been seen, and never has been possible in all the weary millenniums which have dragged over its thirsty wastes. Though there has been irrigation in India from time immemorial, it has been on a small scale. No vast projects were ever undertaken until the British occupation, such, for example, as the Chenab Canal, which irrigates 2,000,000 acres, or two-fifths as large an area as all of cultivable Egypt—a canal with six times the discharge of the Thames at Teddington. Thirteen millions of acres of the 44,000,000 acres under irrigation in India are watered from wells, but the vast government undertakings have become the main insurance against the recurrence of famine, that dread visitant in this overcrowded land.

The first Presidential message to Congress recommending Government aid to agriculture was that of George Washington, in 1796, himself a member of the first agricultural society ever organized in the United States. He recommended "a national board to encourage and assist agriculture * * * by stimulating private enterprise and experiment."

The first Presidential message recommending aid to irrigation and the national control of water-supply was the first message to Congress of President Roosevelt, December 3, 1901.

Legislation waited on Washington's recommendation forty-five years later,

when Congress appropriated £200 for the purpose, which the Government took three years to spend! Within seven months after the recommendation of President Roosevelt, Congress enacted the most beneficent piece of public-land legislation which has become a law since Abraham Lincoln signed his Homestead Act in 1862. Eleven days after the measure became a law, recommendations were made for the withdrawal from entry of areas in six localities to prevent speculative filings on them, pending an act.

On the third anniversary of the passage of the Reclamation Act, on June 17, 1905, and within three years and seven months of the first presentation to Congress by a Presidential message of any plan for the national policy of the reclamation of arid lands by irrigation, water was turned on to 50,000 of the thirsty acres of Nevada, the first section of this national project to be completed. This is known as the "Carson" project. A very interesting incident in connection with the digging of the ditches of this project illustrates the value of the Hydrologic Survey. This irregular tract comprises a flat desert, which lay in the line of the immigrants' trail to California about the time of the gold discovery. There were here forty miles of country where never a drop of water was to be found. It was several, and sometimes many days' journey, with horses or mules or oxen, and every drop of water used had to be carried with them. Not all the immigrants knew this, and the consequence was that hundreds perished, with thousands of animals, and very often the only monument left to mark the spot where some father, mother, son, or daughter had perished and was left six feet deep in this desert soil was an old gun-barrel or steel ramrod to mark the place. Three wagon-loads of such pathetic mementoes were recovered from the digging of the main ditch. But the Hydrologic Survey has ascertained the fact by this time that this entire region, in fact almost the whole of Nevada, contains vast quantities of underground water, and had any one out of

those thousands of sufferers dugged a grave six feet deeper, he would have found a well of life-giving water.

It is believed by the hydrographers who have surveyed the states, that the artesian water from the underflow of the streams and valleys can eventually be utilized for irrigating an additional 1,600,000 acres in Nevada alone, very much the greater part of whose land surfaces are so arid that they have hitherto been considered as irreclaimable desert.

Mr. C. J. Blanchard, statistician of the United States Reclamation Service, writes in a picturesque way of that far southwestern corner of the United States, "where everything bears mute evidence of a terrible struggle for life. It is the land which some one called 'The land that God forgot.' Everything that grows is covered with a thorn; everything that crawls is deadly. It is a topsy-turvy wonderland. We may not drink of the waters of the desert stream, for they are salty. In this strange region they dig for wood and climb for water, for the water is found in cup-shaped pools in the hills, and the wood is the big root of the Mesquite."

Down here somewhere is where the Salt River has cut through the mountains a narrow gorge, in which the Government is putting a dam of cement and sandstone, which will rise 284 feet above the river. This dam will be 170 feet thick at the base, 1,080 feet long on top, with a roadway twenty feet wide across it.

Down in the bed of the canyon is the city of Roosevelt, with its schools, churches, and houses, with electric lights, waterworks, and modern equipments, built by the Government for the dam-builders, which will soon lie 220 feet in the new inland sea, from which canals will carry water to assuage the desert thirsts below.

Every one of the twenty-eight Government projects which are scattered over the whole western half of the United States presents some new and interesting engineering problem to be solved. * * *

Any detailed account of one, or of

all, of these projects, forms a subject and a task by itself. This is not the place to recount the details of all the different projects undertaken under the new national policy by the United States Government. But this much is certain, that the initiation of the project considered as a Government enterprise is another silver screw in the lead coffin of *laissez-faire*. It is sufficient to say that within seven years after the first recommendation ever made by a President to a Congress on the subject, many thousand people have already made their homes on land that was once a desert, and considered worse than useless, and was the home of the lizard and the rattlesnake. There are 25,000,000 acres of land already planned by the Government into farms and homes and cities, and, according to the late Major Powell, there are 75,000,000 acres more of this land capable of such transformation, where many millions of people will be able to make their homes, and the whole thing done on such business principles as that in fifteen years longer it will not have cost the United States Government so much as the value of a copper halfpenny in principal or interest.

Surveys and perfected estimates have been completed for twenty-eight irrigation projects. Out of these, all begun, many are finished and are already producing abundant crops.

A summation of the work of the Reclamation Service for 1907 shows that it has dug 1,881 miles of canals, or nearly the distance from Washington to Idaho. Some of these canals carry whole rivers, like the Truckee River, in Nevada, and the North Platte, in Wyoming. The tunnels excavated are fifty-six in number and have an aggregate length of thirteen and one-half miles. The Service has erected 281 large structures, including the great dams in Nevada and the Minidoka Dam in Idaho, eighty feet high and 650 feet long. It has completed 1,000 headworks, flumes, etc. It has built 611 miles of wagon road in mountainous country, and into heretofore inaccessible regions. It has erected and in operation 830 miles of

telephones. Its own cement-mill has manufactured 80,000 barrels of cement, and the purchased amount is 403,000 barrels. Its own sawmills have cut 3,036,000 feet board-measure of lumber, and 23,685,000 feet have been purchased. The surveying parties of the Service have completed topographic surveys covering 10,970 square miles—an area greater than the combined areas of Massachusetts and Rhode Island. The transit lines had a length of 18,900 linear miles, while the level lines run amount to 24,218 miles, or nearly sufficient to go around the earth.

The diamond drillings for dam sites and canals amount to 66,749 feet, or more than twelve miles. To-day the Service owns and has at work 1,500 horses and mules. It operates nine locomotives, 611 cars, and twenty-three miles of railroad; eighty-four gasoline engines, and seventy steam engines. It has constructed and is operating five electric-light plants. There have been excavated 42,447,000 cubic yards of earth and rock. The equipment now operated by the Service on force-account work represents an investment of a million dollars.

This work has been carried on with the following force:

Classified and registered service, including Washington office..	1,126
Laborers employed directly by the Government.....	4,448
Laborers employed by con- tractors.....	10,789

or a total of all forces of 16,363. The expenditures now total nearly £250,000 per month. As a result of the operations of the Reclamation Service eight new towns have been established, 100 miles of branch railroads have been constructed, and 14,000 people have taken up their residence in the desert.—*The Statistician*.

WASTF

Nothing in all the history of civilized nations in modern times has shown a wastefulness so reckless, so insensate, so criminal, as the wastefulness of the American people with the natural re-

sources of their continent. The net result is the modern American billionaire and the imminent bankruptcy of the continental domain. Whatever gratitude posterity may cherish for institutions bequeathed, may be overcome by the indictments of the disinherited descendants of those who, in their insane scramble for immediate gain, have cried, "After us the deluge," and have burned the Nation's patrimony.

For a President to have discovered this; to have been intelligent and forceful enough to have, in a measure, stopped it; to have guaranteed our great-grandchildren the remnants of use left of a great geographical inheritance, is quite enough for one man in a lifetime to have accomplished.

The report of the National Conservation Committee, now in the hands of Congress, presents an appalling indictment of the political intelligence of the American people.

Three generations ago the American forest covered an area of a million square miles, one-third the land surface of the United States. Now there is not enough timber left to last the generation playing marbles in the school-yard.

Although the mineral production of the United States is second only to agricultural value, adding £400,000,000 per year to the national wealth, the waste in mining and treatment of mineral substances sum up an average loss to the American people of about £60,000,000 a year. The use of fuels which supply light, heat, and power, owing specially to the fact that manufacturing has increased so rapidly, has itself increased much more rapidly than the population of the country. The available and accessible supplies of coal in the United States aggregate 1,463,800,000,000 tons. But this includes the poor coal; we have been using the best and most accessible. We have already used seven and one-half billion tons and wasted nine billion tons of coal. The anthracite will hardly last twenty years, and the bituminous 100, at the present rate. But the use of coal is increasing almost, as it were, in geometrical progression, for in the decade

1896-1905 almost as much coal was mined as had been produced during the whole previous history of the United States. In 1906 the consumption was forty-six per cent greater than that of the average of the preceding decade, and the next year, 1907, consumed 66,000,000 tons more than was mined in 1906. Mr. Carnegie has said: "Still more wasteful than our process of mining are our methods of consuming coal. Of all the coal burned in the power plants of the country, not more than from five per cent to ten per cent of the potential energy is actually used. * * * Indeed, in ordinary electric-light plants, hardly one-fifth of one per cent, one five-hundredth part, of the energy of coal is actually utilized." Dr. I. C. White, state geologist of West Virginia, said at the White House Conference, speaking of the waste of natural gas: "From personal knowledge of conditions which exist in every oil and gas field, I am sure the quantity will amount to not less than one billion cubic feet daily, and it may be much more. The heating value of a billion cubic feet of natural gas is roughly equivalent to that of one million bushels of coal. What an appalling record to transmit to posterity."

"There can be no doubt that for every barrel of oil taken from the earth there have been wasted more than ten times its equivalent in either heating power or weight of this, the best of all the fuels, and also that much more than half of this frightful waste would have been avoided by proper care in oil-production and slight additional expenditure."

The United States is turning out nearly half the iron product of the world, and at a rapidly increasing rate, promising absolute extinction, at the present rate of consumption, in forty years. Inasmuch as there is no reason to suppose that the world will come to an end before that time, there is an imperative call for the geographical economist to take a hand in this insane scramble of individualism.

The loss to farm products due to injurious mammals is something like

£26,000,000 annually, through plant diseases, approximately £80,000,000, and through insects, £134,800,000 each year.

Water is one of the economies of the Nation, as vital to our existence as the air we breathe. The sun lifts from the ocean and spreads out over the United States, in the form of rain or snow, 215 trillion cubic feet of water every year. One-half of this is evaporated, a third of it flows into the sea; the other sixth is absorbed or consumed. Out of the seventy trillion cubic feet annually flowing to the sea, less than one per cent is harnessed and utilized for local purposes, and less than five per cent is used for navigation or power. What becomes of the rest? The question as to whether it shall be economized and used, or wasted and allowed to devastate the land, shall be decided in the future, on the basis of the Nation's verdict concerning nationalism *versus* individualism. Over sixty trillion cubic feet of the seventy trillion cubic feet are not only absolutely lost to all intelligent purposes of a rational government and an economic civilization; not only are they unused for irrigation, navigation and power, but they exhaust themselves in the wholly avoidable devastation of freshets and floods. With the recent denudations of the forest-covers of our water-supplies the steady increase in the yearly damage by floods is startling. Since the year 1900 this annual damage has been steadily increasing from nine million pounds to forty-six million six hundred thousand pounds per annum, with the indirect losses running into figures very much higher than these. It is estimated that the annual loss to farmers alone in soil erosion is £100,000,000, and that the billion tons of soil matter annually carried into lower rivers and harbors, or into the sea, is all of this taken every year off the farms and lands of the country, resulting in even greater losses in the pollution of waters and the impediments of navigation and terminal transportation uses.

This waste of the soil touches the foundations of all and every civilization.

The water flowing to the sea goes back to the land from the sea; the soil never does. The water, as it were, is the devastating agent, the soil the victim. So that as the continental plains are being torn down the ocean beds are being filled up. The water returns to the soil, but the soil remains in the sea.

One of the most important problems, therefore, is to keep the thousand million tons of annually eroded soil on the land which needs it, 400,000,000 tons of which is being emptied into the Gulf of Mexico every year through the Mississippi River alone. When we remember how much of the top of the superficial area of the North American Continent the Mississippi has carried to the Gulf of Mexico, and made a layer approximately a quarter of a mile deep, and laid it over an area of nearly a hundred thousand square miles of the Gulf coastal plain, we realize the importance of stopping the soil erosion, which has been increased rather than diminished by the wasteful hand of man. We must save those forests which Nature has providentially planted along the tens of thousands and hundreds of thousands of miles of tributaries and sub-tributaries, which the settler in his recklessness has been cutting away; we must build great reservoirs in the hinterland where the eroded soil may be deposited, where the water may be clarified and shorn of much of its cutting power, where the water which now stands for freshet and disaster may be held back until the river banks have been bared by the drought; and we must turn these stored floods through the irrigating ditches to fertilize the desert, and over power wheels to make the "wheels go round."

Let it be remembered that it takes 10,000 years for Nature to make a foot of soil, and that through our blundering unintelligence we waste often in ten years what it will take Nature a thousand years to restore.

We are told that the possible horsepower in our streams is over 230,000,000, of which we use about two per cent; that there is enough of this available, *i. e.*, 37,000,000 horsepower,

even now, as cheap or cheaper than steam installation, to exceed the entire mechanical power in use in the United States and to "operate every mill, drive every spindle, propel every train and boat, and light every city, town, and village in the country. And there are over four times this much horsepower running to waste over the Federal Government dams alone."

Mr. M. O. Leighton, chief hydrographer of the United States Geological Survey, says: "Our inland waters are our greatest national resource. The water flowing down our western mountains far exceeds in value the fabulous wealth represented by all the metals and minerals lying between the Rockies and the Pacific.

"To-day most of this resource is wasted. Each year at least 1,600,000 horsepower runs over Federal Government dams. Rented at \$20 per horsepower, this would yield \$32,000,000. Capitalized at three per cent, it represents an investment of \$1,066,000,000 now wholly wasted."

And yet, with an unintelligent and incredible parsimony, we refuse the initial investment which would utilize a large portion of the ninety-eight per cent of waste water-power, while we are using up our coal and gas and oil as if they would last forever.

Out of the 215 trillion cubic feet of water annually raised by the sun and available for human uses, it has been seen that ninety per cent of the available dynamic power in foot-tons of the seventy trillion of cubic feet are not only wasted, so far as economic power and use are concerned, but are each year becoming a monster of destruction more ungovernable. The question of water-supply and conservation and use instead of avoidable disaster, becomes one, therefore, of vital moment for the entire Nation. It requires the immediate and intelligent and sustained attention of the legislative and executive departments of the country, as well as that of the whole people, who must decide at once between the patriot and the land-skinner. This is a subject that cannot even be approached from the point of

view of the individualist. The problems here involved can never be solved without the element of intelligence and patriotism. This is a question of a simple political application of scientific knowledge to the matter in hand, in one great national scheme and purpose, in one continental view, for one universal aim and end, and that is "The greatest good to the greatest number for the longest time."

Government experts have estimated that a working capital is needed for the national conservation scheme of £100,000,000; that the income from water-power alone would pay the whole thing, or that the cost of half a crown a head a year would save 50 shillings a year in certain few avoidable losses. They claim that not only would the destruction of floods and freshets be practically eliminated, and hence this enormous loss be saved, but that such an undertaking, which it would take ten years to finish, besides preventing £30,000,000 per year of flood damage, £73,000,000 annually of loss by forest fires, or £200,000 a day, which could be prevented by intelligent management, would save also £50,000,000 annually alone in transportation if one-fifth the freight could be handled by water; and quite another £100,000,000 in the prevention of soil erosion and through other benefits to farm lands. In these items alone the expenditure of two and sixpence a year *per capita* would save £2 10 shillings a year a head. This is making no account of the water uses in irrigation, the drainage of swamp and overflow land, and a purified and cheaper water-supply, and the consequent prevention of an enormous loss of human life from preventable disease, the economic gain from the mitigation of preventable disease being estimated at £300,000,000 a year. It is pointed out by these experts that there are many indirect benefits which would arise from these projects, *e. g.*, the development of water transportation instead of that by rail would reduce the

increasing consumption of ties and mine timbers, or iron and coal. Every farmer in the country would benefit directly from cheaper transportation. It has been estimated that the income derived from power developed by works for the improvement of navigation would pay the entire cost of maintenance and continue further development, and pay interest on the expenditure of £100,000,000 as working capital. The full development of all the feasible water possibility of the country would furnish a power probably greatly exceeding five times the present total horsepower of all kinds in the Nation, or 150,000,000 horsepower. In addition to the reclamation of 25,000,000 acres of arid land, there are about 77,000,000 acres of swamp land now useless, but of inexhaustible fertility, which, if drained and thrown open to agricultural uses, would, allowing forty acres to each family, furnish homes for 10,000,000 people.

A working capital of £100,000,000 would save, directly and indirectly, £1,000,000,000 a year, and yield vastly more of economic good to the people and their posterity than can be reckoned in pounds and pence; and yet the land is infested with interests whose tools are in Congress, blocking this investment with the cry of "economy" and "deficit," with which they are blocking also the national defenses, and then boasting that we have laid up more wealth in a generation than Great Britain in half a millennium, and own over a quarter of the world's wealth. What posterity will think of these enlightened and disinterested patriots may be imagined from the opinion of some of their contemporaries—this Congress which has refused Mr. Roosevelt's request that £10,000 be voted for the maintenance of the National Conservation Commission. I believe the members of the Inland Waterways Commission worked for nothing and boarded themselves; otherwise we would never have had one.

(To be concluded)

THE NEW POLITICAL SCHOOL

By THOMAS ELMER WILL

MR. J. ARTHUR EDDY, temporary president of the (Denver) National Public Domain League, pays the conservationists the compliment of calling theirs the "new-thought" political school." Mr. Eddy may be building better than he knows.

There is, developing in the United States, a new political school.

It is not attached to any party; its representatives are scattered through or located outside of all political parties.

This school represents a revolt against individualism and *laissez-faire*.

And how are we to understand these terms?

Mr. Eddy regards an attack on individualism as suicidal. Note Webster's definition of "individualism:" "An excessive or exclusive regard to one's personal interest; self-interest; selfishness."

This is exactly what the Denver school stands for; likewise, it is exactly the thing against which the conservationists protest.

What do we understand by *laissez-faire*?

The phrase originated in France in the years preceding the revolution of 1789. It characterized the economic philosophy of the Physiocrats.

In their day, the Physiocrats were reformers, "radicals," "dreamers," "cranks," representatives of a new era whose thought, combined with other men's actions, was to make that era a fact.

They were the protestants against decadent feudalism, the prophets of the new regime of modern business.

Feudalism, then on its last legs, meant paralysis to industry. That the new order might be born, the old had to be overthrown.

To be overthrown, its weaknesses had to be understood, and the superiority of the new gospel made plain.

This task fell to the philosophers—the Rousseaus, Voltaires, Diderots, and D'Alemberts—and to the economists—the Mirabeaus, Turgots, Quesnays, and Gournays.

These men protested against the old restrictions in thought and action, and demanded liberty.

The liberty the economists preached was, however, primarily that of the business man; the man protesting against internal tariff restrictions which forbade him to transport his goods from one portion to another of the kingdom without having them eaten up by dues and charges.

It was a protest against royal orders prescribing the styles of goods to be manufactured, their qualities, sizes, materials, shapes, and other features.

It was a demand that the dying order should take its hands off the newly arising one, and give it an opportunity to establish itself and render its service to the world.

Adam Smith, who revolutionized British economic thought, studied these doctrines at first hand in France, and his book became the bible of statesmen at home.

William Pitt swore by it, and sought, in so far as practicable, to put it into effect.

Barring occasional exceptions, the gospel of Adam Smith's *Wealth of Nations* was the gospel of *laissez-faire*: hands off, leave industry and commerce alone; let each work its will; let the business man buy in the cheapest market and sell in the dearest; give him a free field and no favors; unshackle trade, abolish monopoly, and let wealth flow as freely from point to point, within or without the nation, as the waters flow from shore to shore of the mighty sea.

For the time, the *laissez-faire* economics was necessary.

Feudalism had to be destroyed, modern industry had to be established; to the extent that thinkers and teachers can change systems, men of the type of the Physiocrats and Adam Smith effected this change; and to them the world owes a great debt.

But the new system, like its predecessor, was born to do its work, to die and pass away.

For society is a living, growing, evolving thing; institutional forms are not rigid, but plastic; not permanent, but temporary.

As the snake sheds its skin, human society sheds successively its economic garments, and takes on new ones.

The time came in Europe when "Smithianismus" became a fetter, as feudalism and Colbertism before it had been fetters.

Laissez-faire meant the triumph of the Whig, and the conquest of society, industry, and politics by commercialism; it meant the unbridled, lawless reign of the money-bags.

On one side, society was brilliant; but on the other, it was rotten.

Under *laissez-faire*, help yourself, get all you can, and devil take the hindmost, "the fortunes of Lancashire" grew up, "not by tens, but by hundreds and thousands per cent."

And while swollen fortunes were mounting, Mrs. Browning was voicing the "Cry of the Children," and "the Bitter Cry of Outcast London" was heard in the land.

Gradually, the conscience of Europe awoke; Carlyle wrote his "Past and Present;" Ruskin punctured the bubble of orthodox economics, and German historical economists exposed the absurdity of the "classic" fundamentals.

Like its predecessor, feudalism, *laissez-faire* read the handwriting on the wall.

National self-interest, moreover, opened its eyes, and men who could see beyond the profits of the rich began to reflect upon the question of the national defense.

Could England, for example, with an army recruited from slums and pauper warrens, protect herself from invasion?

And if starvelings could not fight, could they be expected to work? Could a nation maintain its commercial and industrial supremacy with a laboring population depleted, emaciated, and broken in spirit?

To such questions there could be but one answer. How increasingly definite it is to-day becoming we may infer from the goings-on in parliament, the Lloyd George budget, the hustings and the returns from by-elections.

America, the child of England, followed, as was to be expected, in the footsteps of the parent country. As she inherited the common law, so likewise she inherited the economics of England.

Until yesterday, Adam Smith, Ricardo, and Malthus ruled the colleges and universities of America.

To-day, in any up-to-date institution in the land, they are as dead as Julius Caesar.

Why?

Because the era of *laissez-faire* business—long rampant in the United States as in Europe—has at last run its course.

Because the people are awakening to the fact that "get all you can," and "devil take the hindmost" mean one rich man and an army of poor men.

And the army of poor men can out-vote the one rich man, and are gradually getting ready to do so.

Our Denver critics lament that we quote Roosevelt. Why do we?

Because Theodore Roosevelt marked the governmental recognition of the out-of-dateness of *laissez-faire*, and of the incoming of the new regime.

And what is the new regime? Primarily, it is that under which the chief concern of America will be the interest, not of a few industrial magnates, but of the people at large.

It is the era which will recognize that a happy, contented, prosperous, patriotic, intelligent people, with time to live and the ambition to serve, is, from every point of view, vastly to be pre-

ferred to an era in which social and industrial policies are controlled by a handful of millionaires, while a multitude of common people, when permitted, do their bidding for a scant subsistence.

If the Denver champions of exploitation for the benefit of the few will inform themselves, they will ascertain that this new school is abroad in the land.

Were it not invidious, names of its representatives might be quoted at length.

Among them would be found leaders of contemporary literature at home and abroad.

The roll would include names high in the lists of the clergy, here and elsewhere.

Representatives of this school are writing the modern drama, and packing great houses night after night.

At last, after an era of proscription, they are being heard in American colleges and universities.

Others of them address select audiences in the parlors of the rich and cultivated, and multitudes from the most influential platforms.

Further, the spokesmen of this school are to-day found in legislative halls.

In the last session they well nigh captured the American House of Representatives. They speak in thunder tones in the United States Senate; and, while representatives of the old order flock to the cloak-rooms, the great American people stop and listen.

The Denver school may sing its song, but the song is that of the dying swan.

It may boast of the fight that is com-

ing in Congress, but soon, under the dome surmounted by the Statue of Liberty, it will meet its Waterloo.

The people are not dead. Neither are they willing to pass on to their children a land looted and despoiled of its natural resources, and ruled by a few great trusts.

They have not read in vain the history of the Mayflower Pilgrims, who "sailed wintry seas to found Christian states."

The stories of Samuel Adams, Patrick Henry, and James Otis were not taught them for nothing, nor are the names of Wendell Phillips, William Lloyd Garrison, and Harriet Beecher Stowe meaningless.

And they still recall a President who declared that this Nation could not live half free and half slave.

And what lessons would we draw from such history? This, for one:

That the United States of America belongs to the people who occupy its territory, and not to a small percentage of them.

We would learn that, while exploiters and industrial freebooters may thus far have helped themselves to the wealth vouchsafed us all by bounteous Nature, the people meanwhile passively acquiescing, the day of passive acquiescence will not continue.

That day, in fact, has already about passed. The people are reasserting themselves.

Again, they are preferring their claims to that which is indefeasibly theirs; and, henceforth, we may expect them to insist upon the right to live normal, healthful lives, and upon the preservation of the opportunities which alone make such lives possible.



EDITORIAL

Competitive Methods

DISCUSSING Senator Burton's views on water transportation, the *New York Commercial* says:

He goes on record in published interviews as declaring it to be absolutely necessary to secure national legislation for preventing the railroad interests of the country from conspiring to suppress water traffic; he says that it is useless to attempt any development of the freight-carrying possibilities of our American waterways until such a conspiracy has been impossible; and his proposal is that a law should be enacted by Congress forbidding the owners of railroads that parallel waterways to cut the rates of carriage below a certain minimum. Commissioner Smith, in his recently submitted report on transportation by water in the United States—part one, "general conditions of transportation by water"—records substantially the same opinions. * * *

It may be that freight rates are too high nowadays—in some instances it is indisputable—but when it comes to forbidding railroad companies to make rates below a legally established minimum, the proposal does not appear to be in the public interest. If a railroad paralleling a natural or an artificial waterway can haul freight at a profit at rates below those that the waterway can maintain profitably, it most certainly ought to be permitted to do it; otherwise, a burden is placed on the public that is essentially unjust and unreasonable.

Does the *New York Commercial* understand the situation?

More than twenty years ago the country was made acquainted with "the long haul" and "the short haul." In fact, abuses growing out of the long and short haul were potent factors in causing the establishment of the Interstate Commerce Commission.

The point was simply this: Two important shipping points, as Chicago and Omaha, were connected by several competing railway lines. To get business, these lines underbid each other on rates.

This process continued until profits in cases disappeared. Did this mean that the railways lost money? Not at all. What they lost on the long haul between the competing points they made

up on short hauls between points on their individual lines which did not enjoy the advantages of competition. Thus was explained the marvel that goods might be hauled from Chicago to Omaha and thence back to some intervening point at less cost than they might be hauled direct from Chicago to the intervening point.

The same principle has been applied by the packing houses. When the trust's meat-shop moved into town, it proceeded to drive out all the other shops. This it did by cutting rates below the point at which the other shops could live. If necessary, it sold meat for a time at cost or even at a loss.

Then, when the other shops were gone, and the trust shop was secure in its monopoly, it simply raised prices and recovered what it had lost during the competitive war, with as much in addition as the market would bear.

This principle, according to the testimony of waterways experts, is exactly that which the railroads have employed in the destruction of river traffic.

A railroad has paralleled a river, cut the rates on the traffic for which the river competed, made itself whole on other traffic for which the river did not compete, and so put the river out of business.

Now, Senator Burton proposes that this little game on the part of the railroad shall be blocked by the enactment, by Congress, of a minimum rate law.

To this, the *New York Commercial* objects, saying further:

There is no sense in, no justification for, a law that compels the public to pay extra high freight rates merely for the purpose of keeping alive waterways-traffic enterprises that otherwise would die.

From such comments one might infer that the *New York Commercial* was not familiar with competitive methods.

Make the Rivers Available for Transportation

THE tide of western demand for river transportation facilities is steadily rising.

A new and potential argument has been found in the \$8,000,000,000 crop predicted by the United States Department of Agriculture. At first thought, such a crop would seem to call only for rejoicing. However, as in monetary discussions we are constantly informed, crops, to be available, must be "moved."

To move crops we must, of course, have the mechanism of exchange; we must, in addition, have the mechanism of transportation.

The West has by no means forgotten car shortages in the past, and it is now menaced with a similar shortage in the early future.

The Interstate Commerce Commission, through its chairman, Martin Knapp, has announced that the railroads this year will be unable to handle the enormous traffic that will come from large crops and the unusual activity in business and that there will be a car shortage similar to that of 1907, when millions of bushels of grain were left to rot upon the ground in the West because the railroads could not move the freight.

The vision is not enticing. The West has not forgotten the hillocks, almost mountains, of wheat which have been piled for weeks together upon the bare ground awaiting transportation and menaced by storms. But President Hill has long since assured the country of the utter incapacity of the railroads at any reasonably early day to handle the country's freight. The only remaining resource must be those highways used so generally and for so many centuries before railways were dreamed of, namely, the rivers.

Mr. Hill says:

The freight to be carried by the railroads has increased two and a quarter times in ten years. The machine for handling it has increased its size little more than one-fifth. Production and business maintain their

growth and volume. The railroads have nearly exhausted their resources for public service.

In seeking more ample ways for traffic the country turns to its waterways for relief. These are about to emerge into an era of restored usefulness and influence in the development of our resources.

The severest pressure upon transportation facilities and the greatest increase of demand upon them originates in the Middle West. From these fertile lands comes the surplus agricultural product that constitutes the real wealth of this country, and that, either directly or converted into meats or other foodstuffs, furnishes the body of our foreign exports. The time is soon coming when their product will be twice or fourfold what it is to-day. The problem of getting these food supplies out of the central basin and into their ultimate markets is the most vital to its economic welfare that the country has to consider.

A vast traffic like that which will gravitate from the whole interior toward the Gulf as soon as facilities are offered needs river transportation. The embargo on commerce would be lifted. Not only would the products of the Middle West find an open door with a material lowering of the cost of reaching a market, but traffic all over the country would gain by this relief from pressure at critical points.

We have by nature the greatest system of inland waterways on earth; but, as President Roosevelt informed Congress, these rivers are, for transportation purposes, used less and worth less than fifty years ago.

The growing disuse of rivers for transportation is to be traced not to their inutility, but, we are told on high authority, to railway hostility.

Happily, however, this hostility is waning. President Hill, as noted, and President Finley, the first representing the Great Northern and the second the Southern Railway, have publicly declared in favor of the development of our inland waterways. These men possess sufficient breadth to perceive, what the history of waterway development in Europe has proved, that the increased use of the rivers, instead of hindering, has helped railway transportation.

Freight of which railways may in increasing measure well seek to rid themselves, that, namely of excessive weight and bulk, and commanding low rates, had far better be borne by the rivers, leaving to the railways a constantly in-

creasing bulk of other and more profitable classes of freight.

The development here, as everywhere among living and growing things, of the need for "differentiation and specialization" has from the first been inevitable and is now evident.

Our friends, however, who are so deeply concerned in the development of our inland waterways must not overlook the intimate and vital connection existing between those waterways and our forests. They cannot ponder too earnestly the words of Ambassador Jusserand: "It is an absolute principle: no forests, no waterways. * * * The question is as clear as can be: do you want to have navigable rivers, or do you prefer to have torrents that will destroy your crops and never bear a boat? If you prefer the first, then mind your forests. We can tell you, for we know. If the Mississippi is the 'Father of Waters,' the forest is the father of the Mississippi."

Unfortunately, not all waterways advocates have grasped this fundamental truth. For example, one of the leading advocates in Congress of internal waterways voted last March against the Weeks bill, a measure absolutely essential to the protection of eastern and southern waterways. All of which proves the need of increasing education, even in high places, as to the importance, breadth, and depth of the forestry movement.

Farmers Building Their Own Roads

A DESPATCH from Brenham, Tex., tells of a mass meeting of the people of Washington County, of that state, to devise ways and means to establish good roads.

As a result, an organization was effected called the Good Roads Association of R. F. D. No. 9.

We are told that there were over 100 progressive men present, that they agreed to tax themselves 50 cents per month, and that nearly all the members paid the first assessment.

Some may style this "individualism;" some, "communism;" some, "coopera-

tion;" while others may see in it the germ of the town meeting far removed from its habitat in New England, Old England, or the German forest as seen by Caesar and Tacitus.

By whatever "ism" it be characterized, it is good, hard sense.

Governments, national, state, and municipal, have a vast work to do—vaster far than any of them have as yet undertaken.

But this does not exclude initiative on the part of individuals or interested groups.

Schiller's maxim, "Do the duty next to hand," applies not simply to individuals or to Governments, but to all to whom duty may seem clear, and who may not be barred by laws "strictly construed."

The work which might be accomplished locally and without waiting for further legislation is unquestionably vast. At our last annual meeting Secretary Wilson urged that everybody, whether Government did its duty or not, should plant trees.

In like manner many, while urging governmental action but not waiting for it, may enormously promote the good roads movement by attacking the problem where they are.

The Dry-farming Congress at Billings

BEFORE this issue reaches the readers of CONSERVATION, the Dry-farming Congress, due at Billings, Mont., October 26-8, will have been held. This Congress has been thoroughly advertised by a most efficient press agent. The prospect for a large attendance is excellent. Those enlisted in the movement are pressing enthusiastically for the conquest of the desert, not all of which is expected to be reclaimed by irrigation.

The Department of Agriculture, as Secretary Wilson writes Governor Norris, is scouring the world for plants that will grow and put organic matter into the soil during the year that is now occupied in fallowing. Others are working industriously to ascertain the best methods of conserving such moist-

ure as the soil actually receives. There seems little doubt that, between irrigation on the one hand, and dry-farming methods on the other, the arid area will, from now on, rapidly shrink until, we may hope, with the aid of forests for mountain slopes, it will have disappeared altogether.

Where to Get the Money

ON OCTOBER 7 the Upper Mississippi River Improvement Association closed its eighth annual convention in Winona, Minn.

Congressman Tawney, of that city, chairman of the Appropriations Committee of the United States House of Representatives, addressed the association.

He admitted that its object was desirable and "should succeed." The great problem, however, was that of "securing the means."

Said he: "The Government owns all the navigable rivers and all the harbors in the country, and to keep them all in good condition and repair would require a fabulous sum."

The proposition advocated by the convention, namely, a six-foot channel in the upper Mississippi, would require, he stated, twenty millions of dollars for its completion—a sum larger than Congress had ever before appropriated or authorized for any improvement except for the Panama Canal. The proposal for a bond issue was one in which he could not concur.

Mr. Tawney deprecated the costliness of wars, past and prospective, and expressed the hope that "the bill now pending, authorizing the improvement" of the Mississippi "at a cost of \$20,000,000," and "carrying with it an appropriation of \$20,000,000 per year for ten years" would pass. He, however, failed to indicate where the money would come from.

Every conservation proposal coming before Congress may, of course, expect to be met with the cry of "economy and deficit." To this, there are two answers, either of which is sufficient.

First, the country is full of wealth, practically unreachd by taxation. Two ways of reaching it were suggested by President Roosevelt in the following language: "A graduated income tax of the proper type would be a desirable feature of Federal taxation. The inheritance tax, however, is both a far better method of taxation, and far more important for the purpose of having the fortunes of the country bear, in proportion to their increase in size, a corresponding increase and burden of taxation."

Legislation providing for either or both of these taxes might have passed at the recent special session, and might again pass with a little more encouragement. Through such channels, wealth can easily be drawn to meet every proper requirement of the National Government.

Second, conservation, properly handled, yields far more than it costs. To hesitate at an expenditure for reclaiming deserts, draining swamps, improving inland waterways, preventing erosion, or saving forests and water-powers, is like hesitating to spend money for seed corn.

Ordinarily speaking, a crop pays for itself and yields a profit besides; the same is true of conservation policies properly established and administered. To object to them on grounds of national poverty is to confess incompetency in statesmanship.

Courts, Congress, and Conservation

A DECISION recently rendered by a Federal judge in Oklahoma bears upon an aspect of the conservation movement.

Oklahoma is rich in natural gas; the people of that state desire to guard this utility for their own benefit.

To do so they have utilized their state constitution. In framing this document they inserted a section denying to any corporation the right of eminent domain or the use of highways unless a domestic charter was first taken out.

Thus safeguarded, it was believed the state could place upon the corporations such restrictions as it might see fit, and so preserve its natural gas and other interests.

But the constitution-makers, it seems, failed to reckon with the Federal courts. A Federal judge is now reported to have launched a sweeping injunction restraining state officers from interfering with the plans of corporations to pipe gas into other states.

The judge holds that, like grain or coal, natural gas is a product of interstate commerce, with the handling of which the state has no right to interfere.

The state of Maine has a similar law, prohibiting corporations from transmitting electric power beyond the confines of the state.

It is now suggested that, if the Oklahoma law is invalid, the same is true of the Maine law.

But how, may we inquire, may the interests of a state be protected?

If its own legislature is powerless, recourse must next be had to the National Congress, the responsibility of which body is correspondingly increased.

Yet appeals to Congress do not always bear fruit, as friends of Appalachian legislation can testify.

When they call upon Congress to protect the forests and streams of New England and the South by enacting appropriate legislation, they are told to go to the state legislatures, and not trouble Congress with state affairs.

Are the people's interests to be kicked like a football from state legislatures to Congress and back again?

Are their rights to be denied them through a "dog-in-the-manger" policy under which Congress will not, and the state must not take the necessary protective steps?

Is the "twilight zone" between state and Federal jurisdictions to be a permanent obstructive fact?

With the convening of Congress just ahead, light on this point would be appreciated.

Conservation Not Owned by Mr. Pinchot

AS HAS already been pointed out in these columns, the city of Denver is the headquarters for the fast-vanishing but die-in-the-last-ditch contingent who still believe that the yet ungobbled portions of our national heritage belong, by inalienable right, to the grabbers who can get there first.

CONSERVATION, including especially the September and October issues, is evidently read in that fair city, and the wails that ascend from those whose means of gain at the people's expense are threatened by the great American awakening, are wild and weird.

From the press utterances emanating from Denver, it may be gathered that, in the opinion of the contingent referred to, this magazine and the press bulletins issued by this office are the property of Mr. Gifford Pinchot, United States Forester.

For the benefit of these, and any others who may labor under like delusions, a brief historical statement may be submitted.

There was a period when the Secretary of Agriculture was the president of the American Forestry Association, a fact dwelt upon by the present writer in CONSERVATION for March, 1909.

There was also a time, practically coincident with that of Secretary Wilson's presidency, when Forester Pinchot was chairman of the Executive Committee of the same Association, and when other members of Government Bureaus associated with him were members of its Board of Directors.

But on April 24, 1907, Mr. Pinchot wrote the following letter to the Secretary of the American Forestry Association:

Dr. Thos. E. Will,
Secretary, American Forestry Association,
Washington, D. C.

My dear Doctor Will: After mature consideration, I have decided to present my resignation both as chairman and as a member of the Executive Committee of the American Forestry Association. I do this partly because I am about to leave Washington for an absence of six months, and partly because I believe it to be unwise for a Government forest officer to be connected with the American Forestry Association in a

position of such great influence as this. In other words, it is my strong conviction that the Association should stand upon its own feet and be independent of the Forest Service in all respects. While I hope strongly that the Forest Service will continue to contribute all it can to the cause which the American Forestry Association so well represents, I believe it unwise that the two institutions should continue to be merged to the present extent by the officers of one acting also as the officers of the other.

This resignation must take effect upon the date of this letter, and I beg you to call a meeting of the Executive Committee, or to correspond with its members, in order that the committee may choose its own chairman until the Board of Directors can take action.

Very sincerely yours,

(Signed) GIFFORD PINCHOT.

Non-governmental members of the Board, and the Secretary as well, urged Mr. Pinchot not to press this resignation. He was absent for a number of months, and action upon it was not taken.

At the meeting of the Board of Directors preceding the annual meeting of the Association, January 28, 1908, Mr. Pinchot again insisted that he must retire; this time, not only from the Executive Committee, but also from the Board itself. The minutes of that meeting contain the following:

Mr. Pinchot made a statement setting forth that, to avoid confusion in the public mind between the American Forestry Association and the Forest Service, he felt that he should no longer continue as a member of the Board of Directors of the Association. To this end he requested that he be not renominated.

At the same meeting, Secretary Wilson stated that, for the same reason, he ought to retire from the presidency of the Association. As, however, in the case of Mr. Pinchot, other members of the Board strongly demurred, and Secretary Wilson's resignation was deferred for practically one year, at which time it was reluctantly accepted.

At the present time no representative of the United States Government, whether in or out of the Agricultural Department, including the Forest Service, is in any way connected with the management of this organization. No representative of the United States Government has any voice whatever in

controlling or suggesting the policy of this Association or of its publications. No Government representative saw, before publication, or knew in advance the character of any matter that has appeared in this publication since the Ballinger-Pinchot controversy began.

The CONSERVATION magazine is free to criticize Mr. Pinchot and all his works if it sees cause to do so.

That it has supported and still supports him in his conservation fight is due not to his influence or control, direct or indirect, but to the fact that this publication recognizes that in this great struggle he is on the people's side. While he stands there, CONSERVATION will continue to support him. When he fails to do so, this publication, with whatever influence it may command, will be arrayed against him.

Whither Are We Drifting

AT THE meeting of the Colorado Conservation Commission, Dr. John Grass, of Trinidad, endeavored to introduce an amendment to a resolution, his amendment being:

"We recognize the right of Government control of the public domain, and hold that the natural resources of the country belong first of all to the whole people."

Ex-Senator Thomas M. Patterson, chairman of the committee on resolutions, and one of the leading opponents of our National Forest policy, opposed this amendment!

Upon what grounds, is it asked, could any sane, intelligent American citizen oppose such a resolution? His grounds, we are informed by the press, were two-fold, namely, "that the first clause was 'academic' and the second 'socialistic!'"

Is it to this complexion that the forestry and conservation controversy has brought us?

This magazine is not an exponent of socialism; it is, however, an exponent of the principles of the conservation of natural resources.

As such, it stands emphatically, unequivocally, and everlastingly for the

principle "that the natural resources of the country belong first of all to the whole people."

It rejoices, furthermore, at evidence, piled as Ossa upon Pelion, that a daily increasing number of disinterested American citizens and of citizens concerned for the well-being of America and the perpetuity of the race, stand with equal emphasis for this identical principle.

And now comes a former member of the United States Senate announcing that this principle is "socialistic."

CONSERVATION has only to remark that if Mr. Patterson desires to convert a majority of the American people to socialism, he has but to give adequate publicity to the doctrine announced by him to the Colorado Conservation Commission.

Whose Is the Land?

SINCE ex-Senator Patterson shied at Doctor Grass's declaration that "the natural resources of the country belong first of all to the whole people," we wonder what he would think of Prof. Liberty Hyde Bailey's statement at Spokane.

Here is a paragraph from his address given at the National Irrigation Congress, and published in CONSERVATION for October:

In the last analysis, the land belongs to all the people. No man really owns his land; society allows him to use it, and to say who shall use it when he is done with it; and every man is under obligation to society to maintain the fertility of his land. Even a farm is not a man's own, in a sense that he has a right to abuse it without check. More than that, he is under obligation to use all the natural resources of the earth with a care for those who are to come after him. No man has a moral or social right to denude the land of its forest, unless he leaves the land in condition for his successor to utilize it with satisfaction. The American practise of raping the earth of timber has no defense, not only in economics, but also none in moral obligation.

For the Denver school, this should be bitter medicine.

This view, however, rests not simply on the declaration of Doctor Grass or

Professor Bailey. Should it be challenged, a cloud of witnesses in its defense can be produced to whose testimony even that element must listen with respect.

More "Progress" Backward

IN ITS issue of September 20, the *Portland Oregonian* published a half-column story from Washington stating that, "as a result of the Pinchot-Ballinger row, the administration may later determine to recommend the transfer of the Forest Service from the Department of Agriculture to the Department of the Interior."

"Such a change," the writer says, "can only be made by act of Congress, and it probably would call for considerable pressure from the President in order to get the necessary authority, especially if Gifford Pinchot is permitted to remain as Chief Forester."

The writer goes on to argue that the Forest Service is out of place in the Department of Agriculture, having nothing in common with the other bureaus of that department, but much in common with the General Land Office and Geological Survey of the Department of the Interior.

He states that "on several occasions the suggestion has been made that the Forest Service should be transferred" to the Interior Department, "but during the last administration Mr. Pinchot had sufficient influence with the President to get the support of the administration in his objection to the change." Now, however, he thinks, in view of the Ballinger-Pinchot controversy, and the supposed attitude of the President, the latter himself might lead in the demand for the transfer.

The writer continues:

"If the Forest Service was made a bureau of the Interior Department, it would be on equal footing with the Land Office, and under the control of the same Cabinet officer. The Secretary of the Interior then would have a say, not only as to questions of title to forest-reserve lands, but as to all questions of forestry administration."

He repeats that such a transfer would, of course, be opposed by Mr. Pinchot, but he opines that if "Secretary Ballinger believes in the transfer and says so, it is a reasonably safe guess the President will urge Congress to authorize the change."

All of which, of course, is refreshing.

From the tone of the article, one might imagine the writer looked upon such a transfer as in the line of a natural evolution.

Whether or not he knows it, however, the evolution is in exactly the opposite direction. On February 1, 1905, the administration of the Forest Reserves, hitherto in the Land Office of the Department of the Interior, was transferred to the Secretary of Agriculture and turned over to the Forest Service.

As everybody knows, who knows anything about it, this step was one of the most momentous and beneficent ever taken in the history of Government land or forest administration.

Hitherto the Government forests had been in charge of men who knew nothing about forests, while the trained foresters were in the Agricultural Department, where they had little or nothing to do with forests. The act above quoted brought the forests and foresters together, where, of course, they had from the first belonged, and the results have amply justified the move.

But now comes the *Portland Oregonian*, which ranks along with several Denver papers in opposition to conservation policies, and proposes that the Government beat a retreat.

Again, the *Washington Post* recently published an editorial to show that the Interior Department is doomed to disappear. With the appropriation of the public lands by settlers, the work of the Land Office will be finished. The Reclamation Service belongs with the Agricultural Department; the Pension Office, with the Bureau of Commerce and Labor, and so on. But the *Oregonian* would reverse this process and build up the Interior Department at the expense of the Department of Agriculture.

The suggestion that the Forest Service "be placed on an equal footing with the Land Office, and under the control of the same Cabinet officer" should arouse enthusiasm—in certain quarters. The general standing of the Land Office is such that the Forest Service should feel proud of such company.

Within a week, an employee in the Land Office has been heard to remark, unchallenged, in the presence of other employees of the same office, that in the course of a recent vacation trip it had been impossible to discover anybody who regarded any one connected with the Land Office as above suspicion.

Members of the force of that office are, of course, equal in point of honesty with other people, and many, if not most of them, sympathize with the Pinchot policy; but that such an opinion as above expressed should have gained prevalence is a sad commentary upon "Land Office methods" with which the country has become all too familiar.

The notion that the Forest Service has nothing in common with the other work of the Agricultural Department is characteristic of the view of the timber-thieving, resource-plundering class.

The idea of raising successive crops of timber on a forest, as a farmer raises successive crops of grain on a field is, of course, quite beyond them.

With them, timber harvesting is simply a matter of "once and out;" and that "once" for the individual as against the public. Government control, under the Pinchot management, discourages this process, hence their antagonism.

That Secretary Ballinger and his constituents are supposed to be backing this transfer should be enough. With the record that officer has already made, one may guess the result of his control of National Forests.

Let these once be committed to the tender mercies of his department, to which the principles of scientific forestry are unknown, and the public domain is but spoil for individuals, and the looters will once more have their innings.

The headline-writer of the *Oregonian* informs his readers that the "transfer is urged," that the "Forestry Service may go to the Interior Department," that "loud wails are expected," that "Pinchot and the conservationists will set up a howl, but if the President makes the suggestion, the anti-administration will lose out."

If any such scheme is brewing, it is well that it has come to the surface thus early, for the cat is now out of the bag. Forewarned is forearmed. The people are already on the alert; they realize that, if their interests are to be protected, they, themselves, must be constantly on guard, and they are getting ready for the coming session of Congress.

Following the Spokane meeting they were heard from. Let the above attempt be made, and to the outburst which will follow, that which succeeded the meeting named will be but as the popping of a firecracker to a cannonade.

Power and Similar Bills

THE attention of the public has been and is being called to the importance of the water-power question.

As the black coal goes, "white coal"—as water-power is coming to be styled—must more and more take its place.

That this power may be appropriated, legislation must be had and will, without doubt, be diligently sought.

The recent special session of the Sixty-first Congress was supposed to be devoted, almost exclusively, to the tariff. Nevertheless, persons interested in water-power and similar legislation took time by the forelock.

Twenty-three bills, some duplicates, were introduced into one or the other house of Congress in that session. All were printed, several were read twice, and all but one were referred to their appropriate committees. These bills, therefore, are all ready to be taken up and pressed at the coming regular session.

Some of these bills may be harmless; others, however, will bear close inspection.

No power bill should be permitted to pass Congress unless it contains three provisions, namely:

1. The grant or privilege should be limited in time, say to fifty years;

2. The recipient of the grant or privilege should pay to the Government a reasonable fee or charge;

3. This fee or charge should be subject to revision by Congress at intervals, say, of ten years.

The day for grants in perpetuity is past; no more should be tolerated. The attempt, in future, to secure such grants should impugn the good faith of the applicant.

Since water-power is a valuable asset, and its use a source of substantial revenue, the grantee should be willing and should expect to pay for it a reasonable price.

Finally, inasmuch as, with the growth of population and industry, the value of a water-power site whose source is adequately protected may be expected to increase from year to year and generation to generation like the values of lands in thriving cities, the charge for its use should be subject to periodical revision. A utility worth a dollar to-day may be worth ten dollars or a hundred dollars some years hence; for this reason, a long-time contract based on a rate which is fair to-day may, later, become grossly unfair.

One of the chief scandals marking the system of English land taxation is the fact that, until recent years, lands in London were still taxed at the valuation fixed in the year 1602!

Some of those lands have since become worth as much as the gold sovereigns which, placed on edge, would pave them. Yet every attempt to adjust the taxation to the increasing value of the lands was successfully resisted.

To establish to-day in America, in connection with water-power grants of inestimable value, a similar system is preposterous and intolerable. Whoever, hereafter, gets the use of a water-power must be required to pay for it what it is worth. Gratuities and pensions to millionaire promoters should, henceforth, be recognized as "out of fashion."

Following is the list of bills, numbers, names of introducers, and abbreviated titles:

BILLS PERTAINING TO DAMS, LOCKS AND DAMS, NAVIGATION WITH WATER-POWER DEVELOPMENT, USE OF WATERS AND USE OF WATER-POWERS, INTRODUCED INTO THE 61ST CONGRESS, 1ST (SPECIAL) SESSION, SPRING AND SUMMER OF 1909

H. R. 11408 (Tilson)—To construct a dam or dams across the Connecticut River.

H. R. 11592 (Aiken)—Permitting the building of dam across the Tugaloo River at Hattons Ford, Georgia, South Carolina.

H. R. 6277 (Patterson)—To build a dam across the Savannah River, mouth of Stevens Creek.

H. R. 11590 (Aiken)—To build a dam across Savannah River, at Trotters Shoals.

H. R. 11591 (Aiken)—To build a dam across Savannah River at Calhoun Falls.

H. R. 11593 (Aiken)—To build a dam across Savannah River at Cherokee Shoals.

H. R. 1052 (Cullop)—To build a dam across White River, near Decker, Ind.

H. R. 2263 (Crow)—To build a dam across James River, Stone County, Missouri.

H. R. 6867 (Hamilton)—To authorize city of Sturgis, Mich., to build a dam across the St. Joseph River.

H. R. 11579 (Moon, Tenn.)—To amend act relative to erecting of lock and dam in aid of navigation in the Tennessee River.

H. R. 6181 (Hull, Tenn.)—To lock and dam Richland River between Dayton, Tenn., and mouth.

H. R. 11571 (Henry)—To improve navigation of Connecticut between Hartford and Holyoke, and develop water-power.

H. R. 10026 (Richardson)—To improve navigation of the Tennessee over Elk River Shoals and Big and Little Muscle Shoals in connection with development of water-power.

H. R. 10937 (Burnett)—To amend act authorizing use of waters of Coosa River, Alabama.

H. R. 10025 (Oldfield)—To provide for use of water-power on White River, Arkansas, at dam No. 2.

H. R. 1471 (Oldfield)—To provide for use of water-power on White River, Arkansas, at dam No. 1.

S. 2896 (Bulkeley)—To construct dam or dams across Connecticut River.

S. 1120 (Clay)—To build dam across Savannah River at or near mouth.

S. 2179 (Tillman)—To build dam across Savannah River.

S. 574 (Stone)—To build dam across James River, Stone County, Missouri.

S. 2036 (Burrows)—To authorize city of Sturgis, Mich., to construct dam across St. Joseph River.

S. 424 (Flint)—To build dam across Colorado River near Parker, Ariz.

S. 2761 (Bulkeley)—To improve navigation of Connecticut River between Hartford and Holyoke, and to develop water-power in connection therewith.



THE FOREST GIANT

By Charles Albert Brewton

Tall, stately, grand, it rears its head,
The monarch of the woods,
From out its topmost branches peer
The eyes of fairy gods.

King of the trees, it stands erect,
As Nature's monument,
While saplings thin and puny men
Look up in wonderment.

What but a superhuman hand,
A never-failing eye,
Could build from but a single seed
A ladder to the sky?

NEWS AND NOTES

Mr. Start Made Secretary

At a meeting of the Board of Directors of the American Forestry Association held in New York City on October 18, Mr. Edwin Augustus Start, of Boston, Mass., was elected Secretary of the American Forestry Association.

Through his connection with the Massachusetts Forestry Association, of which, for a number of years, he was secretary and treasurer, and because of his activity in the American Forestry Association, particularly in pressing the Appalachian-White Mountain bill, Mr. Start is well known to the members of this Association.

At its last annual meeting, he was elected to the Board of Directors, at which time he nominated Hon. Curtis Guild, Jr., for the presidency of the same body.

Mr. Start was born at North Bridgewater, Mass., June 1, 1863; he graduated at Tufts College in 1884, receiving the degree of A.M. from Harvard College in 1893.

On September 9, 1885, at Windsor, Conn., he married Miss Julia Edith Moor, who died January 21, 1902.

From 1885 to 1892 Mr. Start was occupied with journalism; in the eight years following he was head of the Department of History in Tufts College.

Mr. Start is a member of the American Historical Association, of the New England History Teachers' Association, and of the New England Historic Genealogical Society. He is a Royal Arch Mason, a member of the Phi Beta Kappa, the Theta Delta Chi, the Twentieth Century, and Appalachian Mountain clubs, and a contributor to the department of modern history in the *New International Encyclopedia*. Mr. Start has written numerous articles in magazines, and has aided in launching the new *Twentieth Century Magazine*, successor to the *Arena*.

Mr. Start may be expected to give special attention to Appalachian-White Mountain legislation, together with the other large interests for which the American Forestry Association stands.

Conservation Congress Resolutions

The National Conservation Congress at Seattle adopted the following resolutions on the water-power question:

"We urge upon the states the enactment of comprehensive water laws, framed in accordance with the policy pursued in several western states during recent years, incorpo-

rating the principle that the waters belong to the people. We hold this right of the people to be inherent. Recognizing the necessity of administering this invaluable possession for the people, we deny the right of state or Federal governments to alienate or convey water by granting franchises for the use thereof for commercial or power purposes in perpetuity, or without just compensation in the interests of the people.

"We hold that all natural resources belong primarily to the whole people and should not be alienated by municipal, state, or national grants or franchises to individuals or corporations except for limited periods."

President Taft to the Conservation Congress

President Taft sent to the first National Conservation Congress at Seattle the following telegram:

"I congratulate you upon the objects of your meeting and sincerely hope that your deliberations will result in useful conclusions. You can count upon earnest support from this administration for the policy of conservation of natural resources by every reasonable means properly within the jurisdiction of the Federal executive, and such recommendations to Congress as may best be adapted to obtain useful legislation toward the same end.

"WILLIAM H. TAFT."

President Taft on Conservation

On September 28 President Taft discussed the conservation question at Spokane, Wash. He spoke of the preservation of the National Forests, the reclamation of the arid and semi-arid lands by irrigation, the disposition of water-power sites, and the disposition of coal, oil, and phosphate lands belonging to the Government. Following are his remarks, in part:

"The wonderful progress made by Mr. Pinchot, with the earnest support of Mr. Roosevelt and Secretary Wilson, at times has met the denunciation of persons in this western country on the ground that property was being taken which Congress intended for individuals, and was being withheld from them. But I think general opposition to Mr. Pinchot's plans has disappeared and that the great body of the American people recognizes the benefit of the reform in reference to forestry and greatly regrets that it was not begun years before. Congress has come

fully to recognize the necessity of pursuing forestry reform by making liberal appropriations for the purpose. The forest lands of the United States ought to be surveyed and carefully preserved and its jurisdiction in respect to them clearly defined. The regulation of forests in private ownership within state boundaries is not plainly within the scope of Federal jurisdiction, and it should be undertaken by the states. I don't think that the states have taken up the matter with as much energy as they should, and have not improved the opportunity which was given them by way of example by the Forestry Bureau of the United States. * * *

"There are some thirty projects which have been entered upon by the Reclamation Bureau, and I believe that all of them are to be commended for their excellent adaptation to the purpose for which they were erected and for the speed with which the work has been done. It is believed, however, that in the planning of a number of these improvements the enthusiasm of the projectors has carried them to a point where they begin to feel embarrassed in the matter of resources with which to complete the projects, and begin to show that prudence was not observed by those engaged in executing them. * * *

"Now, it appears that it will take \$10,000,000, or more, which is not available in the reclamation fund at present, fully to complete the projects, and it also appears that a great number of persons, by reason of the beginning of the projects, have been led into making settlements, the expenditure of time and labor, with the hope and upon the reliance that such reclamation enterprises would be carried through in a reasonable time. * * *

"I think it wise to apply to Congress for relief by urging the passage of an enabling act which shall permit the Secretary of the Interior to issue bonds in the sum of \$10,000,000 or more to complete all the projects. These bonds should be redeemed from the money paid into the reclamation fund after the completion of the projects.

"From conversation with Senators who had visited much of the reclamation work, I infer that such appeal seems to them to be the easiest way out of the difficulty, and I shall take pleasure in recommending the passage of such a remedial measure by the next Congress.

"No one can visit this western country without being overwhelmingly convinced of the urgent necessity for the proper treatment of arid and semi-arid lands by the extension of systems of irrigation. The results in the productivity of the soil when irrigated are marvelous. The mere fact that the Reclamation Service has gone ahead too fast ought not to prevent Congress lending its aid to overcome the difficulty. * * *

"I shall * * * urge upon Congress at its next session the passage of a law authorizing the disposition of such water-power sites upon terms to be agreed upon by the Secretary of the Interior with the proposed

purchaser. My impression is that the demand for water-power is going to be so great that these restrictions will not prevent the investment of capital, but will ultimately bring to the public coffers a revenue from an entirely proper source and will secure the development of a power for manufacturing industries that will probably in time exceed the utility and value of coal and become a substitute for it. * * *

"It seems wise, in the disposition of coal lands, and, indeed, of all mineral lands having agricultural value, to separate the surface of the land from its mineral contents, and then either to lease the right to take coal from the lands at a specified compensation per ton—that is, to provide a system of royalties—or to sell the deposits of the land outright to the coal miner. In every case restriction by way of forfeiture ought to be included to prevent monopoly of ownership. This is the greatest object of a change in the method of their disposition. The same provision should be made with reference to the disposition of the phosphate land in Wyoming and Idaho which contains the wonderful fertilizer which it will soon be necessary to use on much of the land in the United States. The oil lands of California, as well as the phosphate lands and practically all the coal lands, have been withdrawn from settlement in order to await the action of Congress, and I expect to recommend to Congress legislation on the lines above indicated. What, however, I wish to make as plain as possible is that these purposes cannot be accomplished unless Congress shall act. The executive can recommend, but the legislature must enact."

The President stated that his administration "is pledged to follow out the policies of Mr. Roosevelt" (with respect to conservation), "and while that pledge does not involve me in any obligation to carry them out unless I have Congressional authority to do so, it does require that I take every step and exert every legitimate influence upon Congress to enact legislation which shall best subserve the purposes indicated. I hope nothing will prevent our taking the further steps needed when Congress meets. Secretary Ballinger of the Interior Department, upon whom will fall the duty of executing the new provisions of the law, is in entire accord with me as to the necessity for promoting in every legitimate way the conservation of the resources which I have named, and he can be counted upon to use the great influence which he must have as Secretary of the Interior to this proper end."

Mr. Pinchot at the Trans-Mississippi Congress

At the Trans-Mississippi Congress, which met at Denver, Colo., August 18, United States Forester Pinchot said in part:

"Conservation as a practical business policy will grow, for it is based, like commerce

itself, on prudence and foresight. It is the application of common sense to the common problems for the common good, and it represents the best spirit of to-day, the spirit which yearly brings this congress together to discuss, develop and promote the common good of the whole West.

"Conservation is the central factor in the galaxy of the Roosevelt policies—the policies of equal opportunity. I want to repeat here what I had keen pleasure in saying at Spokane, that as a Nation we are fortunate at this time in this fact, above all others, that the great man who gave his name to these policies has for his successor another great President, whose administration is most solemnly pledged to support them. And every man who has read President Taft's letter on the importance of conservation to business men will realize how strongly he stands behind the conservation policy.

"The National Forests are a part of the property of the Nation. They exist for the public good, and have no other reason for existence. The governmental machinery organized to make them useful is the Forest Service, and like the National Forests themselves, it has no other object and no other excuse for existence but the general welfare.

"Whatever mistakes it may have made, whatever shortcomings it may have been, or may still be guilty of, I claim for it at least the credit of an honest and earnest effort to be of real use.

"In the times in which we live the road to usefulness commonly follows the line of co-operation. This is true of the great business interests which you represent, and it is no less true of the Forest Service.

"The outlook for forestry has grown steadily brighter of late with each succeeding year, and it was never so bright as now. But of all the good signs there is none so cheerful and none so welcome as the increase in co-operation between the users of the National Forests and the Forest Service. This is due in large part to the establishment of six branch offices in the West, so that the users of the forests can get immediate action on all local questions by men familiar with local conditions and local needs. It is due in still larger part to a better understanding between the users of the National Forests and the Forest Service. The forest users realize better what the Service is trying to do and the Service itself is learning to do better work—adapting itself better every year to the needs and desires of the West.

"It is true that cooperation is not always possible. Increasing usefulness to all the people must sometimes entail smaller usefulness to one or more individuals. Like every other government institution, whether municipal, county, state, or national, the Forest Service is at times required, in the course of its duty, to prevent some man from getting what he would like, but ought not to have. But that is simply a part of the effort for the general good, and the firmness which such

work requires is obviously necessary in the public interest.

"The Forest Service is a public servant—our servant in the work of preserving our forests. It asks, I believe it deserves, and I know it desires and expects your admonition, counsel and assistance in the work the American people have given it to do."

Mr. Pinchot at the Conservation Congress at Seattle

At the First National Conservation Congress, held at Seattle, Wash., August 27, National Forester Pinchot said, in part:

"Conservation has three primary objects: "First, to develop our natural resources, so that this generation may have its full share and use of the riches of this earth.

"Second, to prevent a needless waste and destruction of these resources, so that future generations may likewise have a just share in the material foundation of our prosperity.

"Third, to see that our great natural resources, when so developed, shall be protected and used for the permanent welfare of the many, instead of the few.

"This conservation idea covers a wide field. It aims at the greatest good for the greatest number for the longest time. It is simple, definite, and direct. It advocates the use of foresight, prudence, thrift, and intelligence in public affairs and private business.

"It proclaims equal rights, and it is the duty of the people to think and to act for the benefit of the whole people.

"Therefore, in a word, it demands the application of common sense to common problems for the common good.

"Conservation, the application of common sense to common problems for the common good, will lead directly to efficiency wherever it is given control. We are coming to see that conservation will have two great results—to conserve our natural resources which guarantee our welfare, and to lead our people to greater wisdom and effectiveness in every department of our common life. The outcome of conservation is national efficiency.

"The principles of conservation, thus described, have a general application, the breadth and value of which is very remarkable. The development of our resources and opportunities, the prevention of waste and loss and the protection in this by foresight, prudence, thrift, and intelligence—all this applies with clear and undeniable force to the conservation of our national resources. But it applies just as clearly and undeniably to the conservation of every interest that is necessary for the entire people.

"Conservation, from my viewpoint, is as valuable in education as in forestry. It applies to the body politic as well as to the earth and its minerals. It applies as much to municipal franchises as it does to the earth and its minerals. Municipal franchises

are as squarely within its sphere as franchises for water-power. It applies to the subject of good roads as well as to waterways, and the training of our people in effective citizenship is as germane to it as an increase in the productiveness of our soils.

"President Roosevelt himself said that the policy of conservation is the most typical example of the policies which will bear his mark. Fruitful, vital, and beneficent, these policies are both deeply needed and widely cherished by our people.

"As a Nation, we are fortunate at this time, as I said in my recent speech at Spokane, in this fact above all others, that the great man who gave his name to these policies has for his successor another great President, whose administration is most solemnly pledged to support them."

Pinchot's Conservation Ideas and Municipal Franchises

One of the strongest pleas for conservation of the country's resources was that delivered before the National Conservation Congress, in Seattle, by Gifford Pinchot, United States Forester. Joseph N. Teal, of Oregon, one of the most active workers of the National Municipal League in the Northwest, presided over the session. Speaking of the principles of conservation, Mr. Pinchot said:

"The principles of conservation have a general application, the breadth and value of which are very remarkable. The development of resources and opportunities, and prevention of waste and loss, the protection of the public interests by foresight, prudence, thrift, and intelligence—all these apply with clear and undeniable force to the conservation of natural resources. They apply just as clearly and undeniably to every interest and necessity of the people. The conservation point of view is as valuable in education as it is in forestry. It applies to the body politic as it does to the earth and its minerals.

"Municipal franchises are as properly within this sphere as franchises for water-power. It is as applicable to the subject of good roads as to that of waterways, and the training of our people in effective citizenship is as germane to it as the increase of productiveness in our soils.

"Conservation, the application of common sense to the common problems for the common good, will lead directly to efficiency wherever it gets control. The outcome of conservation is national efficiency."—National Municipal League Clippings.

Hawaii Wide Awake

Mr. Ralph S. Hosmer, chairman of the Territorial Conservation Commission of Hawaii, sends clippings from a number of Hawaiian newspapers showing the alertness of

the press of the island to the conservation situation here, and its appreciation of the merits of the present controversy.

Mr. Hosmer says: "Here in Hawaii the relation between the continued prosperity of the territory and the right use of the natural resources is so intimate that it is perhaps more clearly appreciated than on many parts on the mainland. This has led to the formation of the strong public sentiment in favor of conservation, which recent events only tend to broaden and strengthen."

Speaking of the tendency of newspaper men to emphasize the personal element in the Ballinger-Pinchot controversy, the *Sunday Advertiser* for September 19 says editorially: "But the real question at issue—the vital point—is not of difference between men. It is whether the remaining natural resources belonging to the Nation, necessary as they are to the health and life of the common people, shall be legitimately developed, and exploited in the interest of all the people, or whether they shall be so disposed of to-day that, sooner or later, they could fall into the ownership of great corporations that, controlling the situation, could in the end exact a crushing tribute from all except the favored few in control."

To put the situation more clearly in the same number of words would be difficult.

The *Pacific Commercial Advertiser* of September 23 says editorially:

"That Roosevelt should have found opposition is but natural; that Pinchot should have been blackguarded by those whose destructive enterprise he had stopped was to be expected. That those vitally interested in the exploitation of the great natural resources of the country for their own private gain should object to having the excellent source of revenue cut off was a foregone conclusion. But abuse and threats have not dissuaded Pinchot and his lieutenants from the course which they have mapped out for themselves. The effort to befog the real issue in a mist of political sculduggery will not blind the people to the necessity for conserving the natural wealth of the land, not only for the future generations, but for the enjoyment of the present."

It was understood at the beginning of the controversy that Mr. Pinchot's audience was large. These Hawaiian papers make it clear that this audience is well represented in that remote island, and that the people there have ears to hear and minds to understand.

The Changing Sentiment

Certain masters of industry, not long ago regarded as models of enterprise because of their rapid accumulation of wealth through the exploitation of forests, coal, oil, and gas, phosphates or water resources, now to their great bewilderment, find themselves looked upon with serious suspicion. It is no longer regarded as good citizenship to sacrifice ruthlessly the interests of future generations, in

order that wealth may be accumulated in this. The manager of a great coal or lumber company, who has taken pride in creating an industry, building up a community, and accumulating wealth for himself and his associates, and too much engrossed or too careless to watch the trend of public opinion, is shocked some day into an amazed and resentful consciousness of the changed public attitude toward himself and his enterprise. Is not the coal or the lumber to use? he says. Is it not perfectly legitimate to create wealth by an exploitation of these resources, in the possession of which the Nation is so fortunate? Suppose he does leave a path of destruction behind him. Future generations can take care of themselves, as this generation must. Is he not reaping but the legitimate reward of his foresight and enterprise in acquiring these great bodies of coal and oil, timber and phosphate? Are they not his own? Whose business is it, anyhow, how he mines or how he cuts his lumber? Of course, he does it in the way that yields the largest returns. That's what he is in business for. Fifty per cent of the coal wasted? All the young undergrowth killed? Well, that's because it doesn't pay to save it. You don't expect him to waste his own and his stockholders' money in outlays that bring no returns, do you? So he fusses and fumes. He has not changed, but his standing in the community has. It is irritating beyond understanding. He may even be threatened with indictment because it is found that he has acquired his large holdings of coal or of timber in the usual way by using dummy entrymen. He, the most prominent man in the community, a criminal! Inconceivable. Who is this man Pinchot, anyhow? What is conservation? A fool and his fad. A dreamer and his dream. Away with them. Let us have a business administration.

This type of man has been passed in the evolution of public opinion. A few years ago he represented the normal, usual attitude toward his business. But the public conscience has developed and now he represents only an irritated and decreasing minority. But he has rights that must be respected. He is not criminal in intent. He deserves and will receive a hearing and time to comprehend the change that is coming about, and to adjust himself to it.—Address of Mr. W. C. Mendenhall, of Washington, D. C., before local representatives of the Woman's Rivers and Harbors Congress, Honolulu, Hawaii.

Single-taxers With Forester Pinchot

Among the resolutions passed by the Women's National Single-tax League in its eighth annual conference at Arden, Del., was the following:

"That the league indorse the work of Chief Forester Gifford Pinchot in his strug-

gle to save the heritage of the people for the people; and that the attention of single-taxers be called to the growing importance of water-power sites and to the equally rapidly growing danger of monopolization of those water-power sites."

Irrigation at Yakima

Workmen in the employ of the Government are building a large dredge at the Sunnyside Canal in the Yakima Valley, west of Spokane.

The present water supply is inadequate for the irrigation of the rapidly growing Sunnyside project and it was decided to increase the capacity of the canal, which is now 600 second-feet, to a maximum of 1,080 second-feet, an increase of seventy per cent. An excavator was put to work on the upper bank of the canal.

Many important advantages could be gained by a floating dredger, so the construction of one was commenced two months ago. Twenty-one men are now at work on it, and it will require six engines to operate it. Steam will be provided by two large boilers. The value of this work to the valley cannot be overestimated. It will increase the irrigated area from Parket to Prosser and beyond, which means many new homes, new orchards and fields, and many millions of dollars to be taken from the soil.

Reclamation Service Notes

Mr. F. H. Newell, Director of the Reclamation Service, returned from the West October 1, after a month's trip with the Senate Committee on Irrigation, Hon. Thomas H. Carter, chairman.

The committee visited the reclamation projects in Montana, Oregon, Idaho, Washington, Wyoming, South Dakota, and Nebraska, spending thirty days of strenuous travel. Adjournment was taken until November 1, when the trip will be resumed to visit remaining projects in Colorado, Utah, Nevada, California, Arizona, and New Mexico. The results of the inspection so far have been very advantageous to the work, as the Senators have become personally acquainted with the opportunities and difficulties, and appreciate more than ever the nature of the work and the organization carrying it on.

There was general discussion of the desirability of expediting construction, which is now being carried on with an expenditure of about \$8,000,000 per annum, this being the present income of the reclamation fund. The projects which have been undertaken have been planned with a view to expending economically about this sum, although a larger amount could be used to hasten results.

It is very gratifying to note that President Taft is appreciating this matter and

has announced himself in favor of a bond issue of \$10,000,000. This will enable work which would otherwise take two years or more, to be accomplished in one year. The plans can be readily adjusted, and the organization is able to carry on the work. The Senate committee discussed this matter informally, and individually expressed the opinion that it would be practicable and desirable to issue bonds to the amount of \$10,000,000 per annum for a time, securing these not by the general credit of the Government, but by the reclamation fund, the investment of which already amounts to over fifty millions of dollars. Western bankers express the belief that bonds bearing a low rate of interest and secured by the reclamation fund could readily be floated at par. As a business proposition, it is unquestionably sound. Every dollar invested in irrigation work returns ultimately a gross income to the country of 100 per cent. That is to say, every acre of land reclaimed at a total cost of \$40 will yield each year at least \$40 in crops when handled intelligently. If money can be borrowed at three or four per cent on property yielding an income of 100 per cent per annum, there should be no hesitation in thus expediting the work. The interest charge could readily be included in the cost of the works, as this is repaid by the settlers in ten annual instalments without profit or interest on the investment.

Mr. Newell has been with Mr. Ballinger on several occasions, going over the projects, obtaining from the Secretary and the Senators advice and suggestions with reference to the policy to be pursued in expediting the work in the future.

Mr. Ira W. McConnell, M.A. Soc. C. E., supervising engineer in the Reclamation Service, has resigned to go into private practise. His most notable work for the Government has been the construction of the Gunnison Tunnel which was formally opened by President Taft on the 23d of September. He has also had charge of the large earth dam near Belle Fourche, S. Dak., one of the most notable structures of its kind in this country.

The loss of such a man as Mr. McConnell emphasizes one of the difficulties under which the Government labors owing to the relatively meager salaries which are paid to the higher officials. The work of the Government itself is of such magnitude as to demand the highest possible business efficiency and engineering skill. The services of an engineer who demonstrates ability along these lines are in unusual demand at the present time.

The resignation of Mr. McConnell is a distinct loss to the Reclamation Service.

The Secretary of the Interior has approved a contract entered into by the Reclamation Service and the officials of Spanish Fork City, Utah, whereby the former agrees to furnish the city of Spanish Fork electricity for lighting purposes in amount not

to exceed 65,000 kilowatts per month. The rate charged is eight-tenths of a cent per kilowatt hour.

Crop reports from Huntley, Sun River, and Lower Yellowstone projects are exceedingly satisfactory. The irrigation manager on the Huntley project states that some of the better class of farmers are reporting a net profit from forty-acre farms of from \$1,200 to \$1,800.

The Clear Lake dam of the Klamath project, Oregon-California, as a whole is about fifty-five per cent completed. Excavation for the month of September amounted to 12,000 cubic yards, 10,000 yards being placed in the embankment, making a total in all to date of 24,000 cubic yards.

Construction of the dikes at the south end of Clear Lake is proceeding rapidly. Surveys for the low-line canals on the Upper project and along the margins of the Lower Klamath Lake continued during the month, and fifty-five miles of plane-table topography were taken.

Plans are under way for the construction of a new flume across Lost River, and also for the building of a concrete check in the main canal.

The Lower Yellowstone Valley in Montana and North Dakota, where the Reclamation Service has one of its large projects, furnishes a most impressive example of the beneficence of irrigation. The transformation from a vast free range for live stock to a thickly settled community has come quickly. New towns have sprung up, a railroad is building the entire length of the valley, and as far as the eye can reach broad fields of wheat, oats, and corn dot the landscape which a short time ago was marked only here and there by habitation.

Ten steam threshers have been constantly at work during September harvesting a bountiful crop. With oats yielding from forty to sixty-six bushels per acre, and weighing forty-four pounds to the bushel, and wheat from twenty-five to thirty-five bushels per acre, the farmers are naturally rejoicing. Potatoes are being dug and it is demonstrated that a superior grade can be grown in the sandy loam soils of the valley. A satisfactory crop of field corn was produced by a number of farmers.

The opportunities for homeseekers in this valley are unusually attractive, especially for those who are accustomed to the climate of our northern states.

During the month of September 70,000 cubic yards of material were placed in the Owl Creek embankment of the Belle Fourche project, S. Dak., making a total of 1,348,000 cubic yards to date, and about 40,000 cubic yards were placed in the Owl Creek gap. The fill has now passed the danger point from a raise in the reservoir, since the waste can be carried through the conduits.

The project as a whole is about seventy-five per cent completed.

Good progress is being made in building

the branch line of the Chicago Northwestern Railway through the project. This railroad will pass through the new Government town site which will be opened for the sale of town lots shortly after the completion of this project.

At the present time about fifty Indian and thirty Government teams, with sufficient force of laborers, are engaged on excavation work in connection with the canal system of the Blackfeet project, in northern Montana. A gang of twenty-five men is doing rock work on the same project.

During September construction work was continued on the Jocko and Mission divisions of the Flathead project, Mont., including the building and placing of wooden turnouts, bridges, etc. The excavation for the "K" canal headworks was completed. At Polson excavation work on first-unit canal continued and good progress was made for the first unit. The tunnel force is now grading at the power-house site at the lower end of the tunnel.

In connection with the farm-unit work, sixteen square miles have been mapped, eighty miles of secondary levels were run, and three farm-unit township plats were completed. Much interest was displayed in the auction sale of the Government town sites at Polson and Dayton, the prices secured averaging two to three times the appraised values of the lots.

During the month of September the contractors on the Roosevelt dam, the principal engineering feature of the Salt River project in Arizona, laid 7,800 cubic yards of rock, bringing the dam to eighty-three per cent of completion.

Active work on the concrete construction of the Shoshone dam, Wyoming, was resumed on September 1. This structure is now 181 feet above bedrock, leaving 147 feet to be built.

With the completion of many large structures and the approach of winter the field force of the Reclamation Service is being rapidly reduced. A number of experienced men are resigning to accept private employment; others are going on furlough, and few, if any, new employees are being taken on, excepting in the lower grades.

Owing to favorable weather conditions, construction work on the Klamath project, Oregon-California, proceeded rapidly during September. Three gangs of foreign laborers were shipped in from Portland to make up for scarcity in the local supply.

During September the drainage work on the first unit was completed, and the force of men was transferred to the south end of Clear Lake, where work was commenced on the dikes. The site has been cleared of rocks, the surface plowed, and a cut-off trench under the earth portion of the embankment has been excavated.

The Salt River project, in Arizona, is eighty-two per cent completed. On the great Roosevelt Dam the most important en-

gineering feature and one of the largest structures of its kind in the world is within fifteen per cent of completion.

The cement mill operated by the Reclamation Service was run twenty-six days, with an output of 13,023 barrels burned and 8,901 barrels ground. Good progress was made on the transmission line and substations.

Engineers throughout the country, and especially those engaged in irrigation development in the West, have been greatly interested in the progress of the construction of a remarkable dam across the Colorado River near Yuma, Ariz.

This enormous structure, nearly a mile in length, nineteen feet in height, and 246 in width up and down stream, was built by force account by the Reclamation Service. It rests upon the quicksands of the turbulent Colorado River, and is the only structure of its kind in this country.

Since its completion many prominent engineers of the United States and several from other nations have visited the site.

The erratic stream has several times spent its fury in vain against the obstruction which man has placed in its channel, but the severe tests which the dam has withstood are evidences that it was built to stay.

Mr. Arthur P. Davis, chief engineer of the Reclamation Service, left Washington early in October to inspect the work on the Truckee-Carson project in Nevada. From there he will proceed to points in California, and during November will be with the United States Senate Committee on Irrigation, Hon. Thomas H. Carter, chairman, in the trip through Colorado, Utah, Nevada, California, Arizona, and New Mexico.

Writing from Fallon, Nev., under date of October 10, he said:

"I am delighted with the outlook on the Truckee-Carson project. Many of the settlers have made excellent showings, and they are sufficiently scattered to serve as demonstrations of all the different types of soil. No one can hereafter honestly say that the natural conditions here are not favorable. Many farmers have raised from nine to ten tons of alfalfa, and all fruits that have been tried have succeeded well. Within a few years it will not be possible to buy average land with water right at less than \$100 per acre in this valley."

The project engineer on the North Platte project, in Nebraska, reports a most successful irrigation season for 1909. Notwithstanding the newness and extreme length of the main canal and lateral system, the delivery of water was made in ample quantity to each settler without a single disastrous break.

It is a pleasure to travel over the newly reclaimed lands to view the bountiful harvests. The crops are all made, potatoes are being dug, the corn has ripened, and wheat and oats are in the stack awaiting the thresher. On the whole, the yields have been

satisfactory, and an atmosphere of optimism pervades the valley.

The four-mile tunnel, an important feature of the Strawberry Valley project, Utah, has been excavated 4,383 feet, the rate of progress for September being 370 feet.

The wonder-working miracle of mixing water with the desert soil has been wrought here. A settled, prosperous, and contented community has been established, which from this time on will take its place among the best of the newly developed sections of the West. To the Reclamation Service, the most cheering feature is the complete harmony which prevails in the relations of the local engineers and the farmers. The mutuality of interests is recognized and all are working together for the success of the valley. The Service regards the North Platte project as one of the best examples of the wisdom of the Reclamation Act.

Floods and Forests

Maine has been stricken with great floods, cloudbursts, and rivers overflowing. The extent of the damage, the amount of the loss, cannot be accurately computed. Always following such outbursts of nature's fury there is a train of loss and hardship which escapes the statistician. The lesson is none the less plain, and it is that if the country is not to lay itself open to many such experiences as this of Maine a more effective and comprehensive forestry policy and performance must be attained.—*Boston (Mass.) Advertiser.*

Enrollment in Pennsylvania State College

Pennsylvania State College has enrolled as forestry students ten seniors, twenty juniors, forty sophomores, and over eighty freshmen for the year 1909-10.

Need for Protecting Pacific Coast Forests

A member of the American Forestry Association writes: "There is great need for protecting the remaining forests on the Pacific coast south of San Francisco.

"Santa Cruz County has a satisfactory rainfall for our timber on the Santa Cruz Mountains, but in all of California south of our county the rainfall is irregular and often fails altogether. The little remaining timber in these mountains will be exhausted in a few years. The result will, I fear, be disastrous. The time has come to act."

Forestry Pamphlets

The United States Forest Service and the Bureau of the Census of the Department of Commerce and Labor are cooperating in the

preparation and publication of a series of interesting pamphlets on Forest Products. "The work is conducted under the direct supervision of a committee of four, consisting of W. M. Steuart, chief statistician for manufactures, and J. E. Whelchel, expert chief of division, representing the Bureau of the Census, and R. S. Kellogg, assistant forester, and A. H. Pierson, forest assistant, representing the Forest Service."

Pamphlets recently published cover slack cooperage stock, tanbark and tanning extracts, tight cooperage stock, wood distillation, cross ties purchased, and poles purchased.

Meeting of Connecticut Forestry Association

A field meeting of the Connecticut Forestry Association was held at the home of Doctor Mathewson, "The Larches," south Woodstock, Conn., on October 8. There were forty-six members of the association present. Prof. H. S. Graves, director of the Yale Forest School, spoke upon "The Handling of Woodlands." Mr. S. N. Spring, who was appointed state forester of Connecticut on October 1, addressed the meeting on the subject of "Forest Plantations." After the meeting an inspection was made of the improvement thinnings in Doctor Mathewson's woodlot and an examination was also made of his extensive larch plantation.

The First National Forest in the United States

Mr. Robert Underwood Johnson, associate editor of the *Century Magazine*, criticises the statement by Mr. Philip W. Ayres in *CONSERVATION* for October (page 608) that "Mr. Cleveland established the first National Forest."

Mr. Johnson points out that "the first reserves were established by President Harrison through the efforts of his Secretary of the Interior, Gen. John W. Noble, of St. Louis, who is still living. Mr. Cleveland's service to this great cause is not to be underestimated, but it is well to remember in these days of its general acceptance the farsightedness displayed by Mr. Harrison and General Noble, who were the first persons officially to turn the face of the United States in the right direction."

Mr. Johnson is, of course, correct, as Mr. Ayres will willingly concede. On March 30, 1891, President Harrison created the first reserve, namely the Yellowstone Park Timberland Reserve, while on February 22, 1897, President Cleveland, upon the recommendation of the National Academy of Sciences, created thirteen additional Forest Reserves, of 21,379,840 acres.

Mr. Ayres was, without doubt, distinguishing between a National Park and a National Forest.

Forestry Patrol Recommended

Prof. C. H. Goetz, of the Washington State College, states, from experience in the Cascade Mountains last summer, that the best way to protect a forest against fire or trespass of any kind is to have a sufficient patrol to keep out small fires, and to prevent fires from starting. The moral effect of a good fire patrol on the fishermen, lumbermen, miners, prospectors, and even railroad employees is wonderful, a fact which accounts for the small number of fires started in Washington State last season. If every state that has timber to protect had a state fire association, as has the state of Washington, there would be very little heard about large fires destroying our woods. The Washington State Fire Association has spent from \$50,000 to \$75,000 a year for keeping a good fire patrol, and has found it a paying investment, the annual saving being now three times the cost of fire protection.

Professor Goetz writes enthusiastically of the forestry work in the Washington State College, the situation of which institution for forestry work is highly favorable.

State Control of Maine Forests

Mr. D. H. Darling, treasurer, Bradstreet Lumber Company, writes from Richmond, Me., correcting the news note found on page 642 of CONSERVATION for October, and says:

"The facts are as follows:

"The legislature of 1906-07 interpellated the state supreme court to learn if the state could regulate the cutting of forests without compensating the owners thereof.

"The court's answer, that they could, has been widely circulated, but, so far, the state has not availed itself of the right to enact such a law.

"Since this decision, but one attempt to enact a cutting-regulation law has been made, and this was embodied in the bill I drew and had presented at the last session, but which was referred to the next."

Mr. Darling sends a copy of the bill.

Governor Hughes on Forest Conservation

In his address at the Hudson-Fulton celebration, Governor Hughes said, in part:

"This celebration should not only prove a stimulus to endeavor by its commemoration of distinguished achievements, but it should also quicken our appreciation of the natural conditions which made these achievements possible, and direct our attention to the conservation of this priceless gift of nature. At the headwaters of the Hudson and its principal tributaries we learn the necessity of forest preservation. If we would preserve the source of industrial power, if we would secure and maintain proper regulation of the

flow of our streams and make them agencies of progress rather than devastating forces, we must conserve the forests of the country. It is only within a few years that we have appreciated the importance of this policy. The people have not awakened too soon. In the state of New York during the past few years large areas of forest tract have been acquired by the state, and under the amendment to the constitution adopted fifteen years ago all lands so acquired are to be kept inviolate. It is to be hoped that these purchases will largely be extended and our forest tracts put beyond danger of devastation.

"The river should be kept, so far as possible, free from pollution. We must maintain this noble stream as a wholesome river and not permit it to become a mere sewer. This is a problem of great difficulty because of local exigencies and of the demands of established industries upon which the prosperity of many of our communities depends. There are diversities of conditions which should have intelligent appreciation, but we must not be indifferent to the necessity of protecting the health of the people and to the importance of keeping our streams pure."

Governor Hughes also plead for the preservation of the scenery of the Hudson, and expressed the earnest hope that the two states interested would cooperate "to safeguard the highlands and waters in which they are both deeply interested."

Conserving Miners' Lives

Lyman Beecher Stowe says in the *October Outlook* that about 30,000 men have been killed in the coal mines of the United States since 1889. About 7,000 were killed and injured in 1906 alone, and, in 1907, he states that over 3,000 were killed and 6,000 injured. Mr. Stowe's article, which is entitled "To the Rescue," describes the work of the newly organized Government Rescue Corps, started as a result of the work of Dr. Joseph A. Holmes, chief of the Technologic Branch of the Geological Survey. In May, 1908, Congress authorized the investigation of mine explosions, and in July, 1909, a Federal appropriation of \$150,000 was made to start mine-rescue work in connection with a station which had been opened the previous December in Pittsburg. Three foreign experts on mine disasters came to this country with suggestions for the development of the rescue corps. The Government has already established two experimental stations, the one already mentioned at Pittsburg and a substation at Urbana, Ill., in connection with the University of Illinois. Government mining engineers are assigned to these stations, and aside from the rescue work the experts test explosives.

Reports on all mine accidents, both in the United States and foreign countries, are there collected. After each disaster mine experts

are sent to study the conditions and find out, if possible, the cause of the accident. The data thus gathered are then tested by experiments in the artificial mine galleries and in a mine which is used as an experimental laboratory. The Government is to establish other mine stations at or near the greater centers of accidents.—*The Survey*.



Drainage Circular

Mr. J. O. Wright, supervising drainage engineer of irrigation and drainage investigations of the United States Department of Agriculture, has prepared Circular No. 76 entitled "Swamp and Overflowed Lands in the United States, Ownership and Reclamation."

This circular carries a map showing graphically the swamp and overflowed lands in the states east of the Rocky Mountains, the total area of which is almost equal to that of Illinois, Indiana, and Ohio. Florida leads in swamp lands, Louisiana is second, Arkansas, Mississippi, Minnesota, North Dakota, Michigan, South Carolina, Georgia, and North Carolina follow in the order given.

Mr. Wright declares that "after considering what has been done to reclaim the marshes of Holland, two-fifths of which lie below the level of the sea, and the difficulties that have been overcome in draining the fens of England, it would be a reflection on the skill and intelligence of the American engineer to proclaim the drainage of our swamp lands impossible." On the contrary, the engineering problems are simple.

Mr. Wright argues that drainage is a public function, but that the cooperation of the interested landowners is necessary. Drainage legislation, he maintains, should be enacted.

"Were there 77,000,000 acres of swamp and overflowed lands drained," says Mr. Wright, "and made healthful and fit for agriculture and divided into farms of forty acres each, it would provide homes for 1,925,000 families." The swamp he regards as a nuisance which should be abated and made to contribute to the support and upbuilding of the United States.



Redeeming the Great Valley of California

Mr. A. D. Foote, M. Am. Soc. C. E., has prepared a paper entitled "The Redemption of the Great Valley of California."

The writer compares conditions in the Great Valley with those in Egypt. He mentions a case where 5,000 acres of wheat were flooded in the winter of 1908 and 1909, "but that the owner did not regret it much, as the next crop would be more than doubled by the fertilizer deposited by the water." "In this simple statement," says Mr. Foote, "lies the secret of the redemption of the valley. It is no exaggeration to state that the floods of

last winter carried down enough fertilizing material to produce millions of bushels of wheat, could it have been placed at the disposal of the tiller of the soil."

He continues: "If engineers would study Egypt and follow the teachings of her long experience, in so far as conditions admit, they would be trying no experiment." The basin irrigation of upper Egypt, gradually developed through 5,000 years, has proved in that country highly successful.

"Basin irrigation is dividing the land with dikes into so-called basins and introducing flood-water, usually carrying considerable sediment, from two to six feet deep over the entire area, and letting it stand for several weeks until the sediment has settled and the water has soaked into the soil as much as it will. The water is then drained off quickly, and the crop is sown on the mud, often before it is dried sufficiently even to harrow. The areas of these basins depend largely on the slope of the land. In Egypt they vary from a few acres to, in one instance, 40,000, the average being about 5,000 acres. This system of irrigation would be especially beneficial to alkali lands. The experience in Egypt is that where land has deteriorated and shows white efflorescence from perennial irrigation, one or two years of basin flooding restores it to its former state, and in no case has basin irrigation produced alkali lands."

This method Mr. Foote regards as entirely practicable in the Great Valley of California, and far superior to dependence on "precarious rainfall to grow an inferior crop on a deteriorated soil, and unsuccessfully fending off the flood in terror lest it destroy the country."

"It is proposed, therefore, to construct dikes to form basins, as in Egypt, over the entire floor of the Great Valley, comprising some 3,000,000 acres; and to feed these basins, during the winter or flood time, by suitable regulating gates and dams, from the various rivers and creeks entering the valley; and to regulate and control the feeding of the basins so as to relieve the rivers of flood waters, as much as possible, and hold these flood waters in the basins, or let them move slowly through, that they may deposit the silt and soak the land, and finally drain through escape channels in time for the crops to be sown in the spring. It is proposed to provide escape channels, through the lowest parts of the valley, of sufficient capacity to drain the basins rapidly, if required, and assist the rivers in times of excessive floods."

This scheme, Mr. Foote admits, will cost many millions—possibly \$75,000,000. On the other hand, he is convinced it will return hundreds of millions.

The money, he holds, "can be borrowed by the state as needed, and returned to the state by the lands benefited, in instalments, after the benefit has been received, in a manner similar to that followed by the United States Reclamation Service."

Mr. Foote's paper is accompanied by an admirable map of the Great Basin, and is reprinted from the Proceedings of the American Society of Civil Engineers.

A National Land Exposition in Chicago

From November 20 to December 4 of this year will be held in the Coliseum, under the auspices of *The Chicago Tribune*, the United States Land and Irrigation Exposition, which will provide authoritative, graphic information about the vast land opportunities now opening up in many states for homeseekers, farmers, and investors. There will be exhibits of the wonderful fruits of virgin soil from all sections of the country. Elaborate panoramas will show what is being done to irrigate, drain, and cultivate it. Arrangements have been made for Government exhibits of great value.

The National Land Laws

During its existence as a nation the United States has given or sold to private owners hundreds of millions of acres of public lands which to-day represent in their total a valuation expressed in billions of dollars. The policy adopted and pursued in the early days was defensible and even commendable. Settlers were wanted in the great West and inducements were necessary. Free land or cheap land proved an irresistible attraction and settlers swarmed westward. Railroads were needed, and land grants on a gigantic scale made railroads possible. Under this system endless miles of wilderness became one of the world's greatest producing areas and the home of millions of industrious and prosperous people.

The change in conditions was not attended by change in the laws. There was a continuance of the policy of treating public land as of little or no value, to be given, or at best sold cheaply, to those who applied for it. Under these antiquated laws petty frauds and gigantic swindles came into existence and flourished mightily. All attempts to remedy the evil, to adjust the laws to the new conditions, were fought by the representatives of those who were making money by processes which were, in fact, the equivalent of robbery of the American people. All efforts to punish offenders were blocked and delayed, in spite of the courage and the fidelity of such men as the late Ethan Allen Hitchcock, until the prosecution of land-fraud cases has come to be almost a farce.

Last year the General Land Office reported the United States (the American people) as the owner of 754,895,296 acres of "land areas unappropriated and unreserved." This includes Alaska's 368,021,509 unsurveyed acres. Leaving out the Alaskan area and the appropriated and reserved areas of the country proper, it appears that the United States is

now the proprietor of 386,873,787 acres of the least valuable land out of an original possession of 1,441,436,160 acres. Out of this 226,690,938 acres are reported as "surveyed" and 160,182,849 acres as "unsurveyed." Very little farming land remains for distribution. Much the larger part of the timber land has been either distributed or included in the National Forests. The mineral resources of the unsurveyed regions are either little known or quite unknown. * * *

The gift or the bargain sale of highly valuable forest and mineral lands for the enrichment of the few by the careless liberality of the many is now a national folly. Every possible acre of public land should be reserved until by proper survey a fair valuation can be determined and a fair price set on the property. About three-quarters of the original national holding has passed into private hands. A considerable percentage of the whole has undoubtedly been acquired by processes of doubtful legality, and much has been acquired by glaring fraud. For what remains as national property new laws should be devised in the interest of the present owners, the people of the United States.—*The Sun*, New York City.

Let's Focus on Something for Conservation

What if every man, woman, and child in the whole country could be convinced of the need for a vigorous conservation program? Would they get it? Not in a thousand years if they didn't organize the fight.

The Forester has been at work to organize that fight for ten years. The administration tells us it is doing all it can to the same end now. The Conservation Commission and the American Forestry Association are far from idle. But all these forces together have not gone a great ways.

James J. Hill has hit the conservation nail on the head. There will never be any progress, thinks that astute empire-builder, until the plan of waterways development is made solely in the light of the greatest good to the whole country. Congress will keep to about its present tire-exploded pace as long as Goose Creek is fighting Sugar Run. So with restrictive legislation as to the cutting of young timber. So with planting for the protection of soils. So with everything else—even the tariff.

A waterways commission was Mr. Hill's plan. It would require Congress to eliminate itself. But the end is so much to be desired that maybe Congress could be persuaded to do so. Then, in the further judgment of this same student, there must be sane financing. * * *

What ought to be done by the friends of the conservation movement, and done right away, is this:

The fight should be focused. There ought to be as nearly as possible unanimous demand upon Congress for one thing. That

one thing should be a commission to lay general foundations for future appropriations as to the further purchase of national forest lands, the development of mineral resources in the public lands, the protection of soils, as well as to digging channels and building dams.

If that can be accomplished—and there is a tangle sight more chance of it than of getting any billion-dollar bond issue—then there is some hope for the whole cause of conservation. Somebody ought to send out a farmers' bulletin on the need of getting together.—*Washington Times*.

Colorado Conservation Commission Resolutions

Among the resolutions passed by the Colorado Conservation Commission at its recent meeting were the following:

A resolution expressing the intention of the Commission to cooperate with the state and Nation in every proper conservation effort, in which monopoly was guarded against and the law respected.

A resolution indorsing the general conservation policy of the Government and urging other states to cooperate in the work.

A resolution advising the Government to limit the time of its franchises for water-power on the public domain.

A resolution favoring legislation to prevent mineral lands being obtained under the guise of agricultural land.

A resolution favoring legislation encouraging bona fide irrigation enterprises.

A resolution favoring more stringent game laws.

A resolution favoring the plan of taxing timbered land on its value outside of the trees on it, and favoring the exemption from taxation of all land up to ten acres which any settler plants in new trees.

A resolution favoring the cooperation of the state with the Federal Government in protecting the forests from fire and depredation.

A resolution favoring the sale of matured timber on forest reserves to settlers needing it for local consumption.

Japanese Visitors in America

The party of honorary commercial commissioners of Japan, a large and distinguished body composed of noblemen, captains of industry, educators, agriculturalists, financiers, lawmakers, and men prominent in the affairs of the empire, now touring the United States, met with a distinguished reception in Spokane.

Baron Shibusawa said: "Often we have traveled in England and Europe, and in the smoky cities we have seen signs, 'English spoken.' To-day in your beautiful city we have seen 'Japanese Spokane.' * * *

"You have spoken in warm terms of our progress, but you have not mentioned the fact that we owe it all to America. If it had not been for America—for Commodore Perry—we would not to-day have been able to boast of the progress of which we have been so proud.

"You are citizens of the inland empire of the West, while we are of the island empire of the East; I have heard that Spokane means 'sons of the sun,' while our nation, too, claims descent from the goddess of the sun, so that our two peoples would, after all, seem to be really one."

Mr. Poindexter was cheered to the echo in closing his remarks with the declaration that the wealth of forest and water on the mountain slopes belongs to the people, and should be protected for their benefit.

Jinie Nishimura, member of parliament and president of the Kyoto Chamber of Commerce, who has started transportation projects with capital aggregating \$500,000,000, headed a party of bankers and experts on a visit to the Washington Water-power Company's works, and they expressed keen interest in the machinery and turbines. The falls of the Spokane River, where thousands of horsepower electrical energy is generated, also proved a source of interest.

Waterways Meetings

Waterways meetings abound. On October 7 the Upper Mississippi River Improvement Association closed its eighth annual convention in Winona, Minn.

On October 7 the Good Roads and Waterways Conventions called by Governor H. H. Hadley, of Missouri, met in Sedalia, of that state.

On October 14-15 the Ohio Valley Improvement Association met in Cincinnati, Ohio.

On October 21-23 the fifth annual convention of the Interstate Inland Waterways League was held at Corpus Christi, Tex.

On October 29-30, and November 1-2, the Lakes-to-the-Gulf Deep Waterways Association will meet at New Orleans.

On November 10-11 a waterways meeting will be held at Fort Wayne, Ind., to promote the Toledo, Fort Wayne and Chicago Deep Waterway project designed to construct a ship canal connecting Lake Erie and Lake Michigan by way of the Maumee River and Fort Wayne.

On November 15-16 the Mississippi-Atlantic Inland Waterways Association will meet at Jacksonville, Fla.

On November 17-20 the Atlantic Deep Waterways Association will hold its second annual convention at Norfolk, Va.

Meanwhile the American Waterways Commission, with Senator Burton, chairman, is touring Europe studying the inland waterways question.

Meetings of the American Society of Mechanical Engineers

Meetings of the American Society of Mechanical Engineers have been advertised as follows:

In New York, on Tuesday evening, October 12, at eight o'clock, in the Engineering Societies Building, with a paper by Prof. R. C. Carpenter, of Cornell University, upon "The High-pressure Fire System of New York City."

In St. Louis, jointly with the Engineers' Club of St. Louis, on Saturday evening, October 16, Professor Carpenter's paper to be repeated.

In Boston, on Wednesday evening, October 20, at eight o'clock, jointly with the Boston Society of Civil Engineers, in Chipman Hall, a paper to be presented by Prof. Gaetano Lanza and Lawrence S. Smith on "Comparison of Results Obtained by the Use of Three Theories of the Distribution of the Stresses in Reinforced Concrete Beams," with the experimental results.

The Nature Lovers' League

To aid in awakening the public conscience to a sense of moral obligation toward vanishing nature, the La Rue Holmes Nature Lovers' League was organized, not quite two years ago, and is doing its part to that effect.

This movement originated with a young naturalist, connected with the Museum of Natural History, New York City, whose name was given the organization after his premature death, when but upon the threshold of his intended work. It was the outgrowth of an intense, sorrowful love for retreating nature.

The Nature League accomplishes its purpose largely through the formation of chapters in schools, both public and private; the introduction of literature and lectures treating of natural history themes and of kindness to all the humbler forms of God-given life—of kindness to humanity by dealing with nature as a sacred heritage to be passed on to the future unimpaired, as far as possible, if not enriched, through our guardianship.

As a means of familiarizing our children and youth with the utility of our birds, the relation between animal and vegetable life, the mission of forests, etc., themes are presented to school chapters, pupils writing brief essays, embodying information given, as well as items of personal observation.

Many of these little essays, written frequently by very young members, are printed through the courtesy of the press, not only stimulating interest among members of league chapters, but frequently presenting items of more or less interest concerning various forms of humble life calculated to

increase sentiment in behalf of nature's passing pageant.

If our forests are not to be remorselessly felled; if our water supply is to be maintained throughout the land; if our birds are not to be sacrificed as mere targets and decorations for the thoughtless, our young people must be led out of the ruts, cut deep across the heart of nature by past generations, and up to a plane of outlook whence may be clearly seen the relation between the preservation of nature's riches and national prosperity.

California to Raise Eastern Hardwoods

The Pacific Coast will soon be the scene of an interesting tree-growing experiment. The United States Forest Service is planning to introduce a number of the more important eastern hardwoods in California, and will this year experiment with chestnut, hickory, basswood, red oak, and yellow poplar or tulip trees. Small patches of these trees will be planted near the forest rangers' cabins on the National Forests, and if these do well larger plantations on a commercial scale will soon be established on wider areas.

There are over 125 different species of trees in California, a number of which produce some of the most valuable varieties of lumber in the country. Although considerably over one half of the species are hardwood or broad-leaved trees, yet, with the exception of the exotic eucalyptus, there is not a single species of hardwood here ranking in commercial importance with the leading eastern hardwoods. Climatic conditions in many parts of California are undoubtedly favorable for the growth of a number of the valuable hardwoods, and the absence of these trees is due mostly to unfavorable factors of seed distribution.

If the experiments are successful, a valuable asset will have been added to the forest resources of this state, which should prove of special benefit to the local furniture and vehicle industries. Chestnut and red oak are highly esteemed for furniture, while with hickory, basswood, and eucalyptus at its command, California should lead all other states in the vehicle industry.

The Smoke Nuisance

The smoke nuisance in cities seems to be not only a burning question but a question of burning—of combustion. A bulletin just published by the United States Geological Survey (Bulletin 373) on "The Smokeless Combustion of Coal in Boiler Plants," by D. T. Randall and H. W. Weeks, gives the results of smoke studies carried on in thirteen large cities and of tests made at the Government fuel-testing plants at St. Louis and Norfolk. A preliminary report on the same subject was made in the Survey's Bul-

letin 334, "The Burning of Coal without Smoke in Boiler Plants," by Mr. Randall, the edition of which is now exhausted. The report just published consists of 186 pages and forty illustrations.

The conclusions reached may be summarized as follows:

Smoke prevention is possible.

Any one kind of apparatus is effective only if so set under boilers that the principles of combustion are respected.

Stokers or furnaces must be set so that combustion will be complete before the gases strike the heating surface of the boiler.

No one type of stoker is equally valuable for burning all kinds of coal.

Although hand-fired furnaces can be operated without objectionable smoke, the fireman is so variable a factor that the ultimate solution of the problem depends on the mechanical stoker—in other words, the personal element must be eliminated.

The small plant is no longer dependent on hand-fired furnaces.

In short, smoke prevention is both possible and economical.



Soil Fertility the Foundation of Progress

Agriculture is being given more prominence among the educators of our Nation than ever before. There are now fifteen state agricultural high schools, and forty others which receive state aid. Two hundred and fifty high schools and academies are giving instruction in agriculture and there are also sixteen colleges privately endowed with funds to carry on this same farm training. One hundred and fifteen state and county normal schools are teaching our teachers to teach these principles. The people have seen a great light. It is a most hopeful sign of a hopeful Nation that we are placing our trust in the soil as the foundation of our material prosperity. Our food comes from the soil. When a man is reasonably assured of his daily bread, he may begin to cast about him for other means of betterment, but the bread must be provided first. As with one man, so with a nation. While we firmly establish our agricultural greatness, we shall have no fear but that our other growth and prosperity and general progress will follow right along. In all this we shall never forget that it is the soil fertility of America that most directly furthers her might.—*The Wisconsin Farmer*.



Maine's Timber Loss

According to Fred A. Gilbert, of the Great Northern Paper Company, of Bangor, Me., the annual loss to the state of Maine through failure to utilize its wealth of timber is over \$10,000,000 on five of the most common kinds of lumber—spruce, pine, fir, hemlock, and cedar. Besides this loss, the state is also

slowly losing its principal asset—the standing growth of the timber itself. This latter loss, in the opinion of Mr. Gilbert, is not due to the annual cutting and marketing, but to the waste and decay and losses by fire and wind.

"Given the needed railroad facilities into this now inaccessible wealth of timber," says Mr. Gilbert, "a proper care in cutting, and an efficient fire patrol, and the state is capable of producing 1,400,000,000 feet of spruce, pine, cedar, hemlock, and fir annually, or 650,000,000 feet (less unavoidable fire and wind losses) more than it is now marketing, to say nothing of hardwoods, and yet gain in the quantity of timber standing."

—*The Paper Mill*.



Reforestation in Ontario

The Ontario Department of Agriculture has published a Report on the Reforestation of Waste Lands in Southern Ontario. It states:

"In spite of the assertions of so-called practical men that nature will look after the replacing of the forest, the following is certain, that on large areas where no seed trees of commercial species exist, it will be impossible to obtain satisfactory new growth within a reasonable time."

It estimates that southern Ontario could eventually have over 10,000,000 acres of private woodlands, and maintains that "it is very important that the private landowner be urged and educated to feel the necessity of protecting existing woodlands, and replanting waste areas. This branch of work can be greatly assisted by demonstrating forestry methods on these larger areas. * * *

"Government forest nurseries * * * will be able to supply planting material to owners anxious to replant waste land.

"In addition to their value as object-lessons in forestry methods, these areas should be preserved for the people of Ontario as recreation grounds for all time to come. * * *

"The policy of putting these lands under forest management has many arguments in its favor. It will pay as a financial investment; assist in insuring a wood supply; protect the headwaters of streams; provide breeding ground for wild game; provide object-lessons in forestry, and prevent citizens from developing under conditions which can end only in failure."



Forestry in California

The California State Board of Forestry issues a small, four-page folder, the moral of which is, "Do your best to prevent forest fires." From it we clip the following items:

"Would you set fire to any man's house?

"If you saw his house burning, would you pass by without doing anything?

"Do you realize that timber is quite as valuable to the owner, and much more so to the community and to you?"

"He can build a new house, but not a new forest. As for your own interest, think over the following facts:

"California has 160,000,000,000 feet of standing timber, even now worth \$400,000,000 as a resource. If manufactured and sold even at present lumber prices, it would bring \$2,500,000,000 into the state for labor and supplies.

"California sells over \$20,000,000 worth of lumber a year. Of this, \$14,000,000 is received by employees, who put it into local circulation. You share it.

"About 1,000,000,000 feet is destroyed by fire in California every year. If manufactured, it would bring in \$15,000,000.

"On every 1,000 feet burned the stumpage owner loses at least \$3, but the community loses \$8 in wages.

"Timber means pay checks to support all industries, but burned timber pays no wages.

"Care with small fires is the best way to prevent big ones.

"Don't toss away burning matches or tobacco!

"Don't make a camp-fire in leaves, rotten wood or against logs, where it may spread or you can't be sure it is out!

"Always clear away all inflammable material before building your camp-fire!

"Never leave a fire until it is out!

"Don't burn brush, grass or slashings without a permit from a fire warden.

"Don't operate an engine using fuel other than oil without having it equipped with a spark arrester.

"Put out any fire you find if you can. If you can't, notify a fire warden or other public officer or the landowner. Remember that any little fire may become a big one if left alone."

Similar folders might well be circulated by forestry and conservation people throughout the country. It is education that counts.

Saving the Great Oak at Edgewood

One of the finest oaks for many miles around has been saved by the aid of the tree surgeon, to be, it is hoped, for many years to come a delight to the eye, a comfort and joy for old and young, for man and beast and bird.

The grand old tree in question stood in the middle of one of the roads at Edgewood, W. Va., and, thanks to the wisdom of those who laid out that village, was not then destroyed. Decay had set in, and each year's rains and insects did their deadly work, until it commenced to look as though its years were numbered. The great hole in the trunk became larger and larger; more from thoughtlessness than any motive of mischief, children—nay, those of larger growth, who knew better—came to fill the hollow trunk with rubbish—motel and offensive. Serenely the oak looked down

upon them all, and with dignity and patience strove to repair the undoing of insects, man and weather. Hundreds of years had this oak been growing in beauty and usefulness; possibly when Columbus first saw the New World it was a lusty young sapling, shouldering its way among elms and beeches. Many an Indian has it sheltered; many generations of men has it seen come and go; many thousands of birds has it sheltered in its arms; many a song has it heard; many a woodland tragedy has it known. Then one brother after another fell before the ax of the settler, until finally our friendly tree stood forth alone, displaying all the majesty of his girth and spread of limb. Perhaps it was a lightning stroke started the mischief of decay; perhaps the wanton carelessness of man. A tree surgeon was brought, who studied the situation, brought his assistants, ladders, tar, cement, skill and knowledge, and to-day our friend the tree rejoices in healing wounds, recovered health and a discharge certificate from the surgeon's hands, prepared to defy the storms of many a year.

The credit for this work is due to Mrs. Virginia Kendall and Miss Nellie Humphreys, of Edgewood.

Exhaustion of Mineral Resources

The report of the National Conservation Commission of 1908, showing the reckless manner in which our natural resources are being wasted, finds an echo in a bulletin (No. 394) just issued by the United States Geological Survey, in which are reprinted the papers on mineral resources contributed by members of the survey to the conservation report. The data on which these papers are based were not obtained especially for the occasion, but were taken from the files of the survey, where they had been accumulating for years. Taken together, they present a state of affairs that may well awaken reflection.

COAL

Coal is considered first, and it is shown that waste in mining loses forever about one-half as much as is marketed. This half is either left in the ground in thin beds or in the shape of pillars to support the roof. Coal has been extensively mined in the United States for not much more than half a century, but the consumption is increasing so enormously that if this increase should continue, all the easily accessible coal would be exhausted by the year 2040, and all coal by the middle of the twenty-first century. It will, of course, not continue at such a rate, for the increasing scarcity will raise prices and check consumption. Water-power, too, will undoubtedly largely take its place.

PETROLEUM AND NATURAL GAS

With regard to petroleum the situation is a good deal more serious. Petroleum has been used for less than fifty years, and it is estimated that the supply will last only about twenty-

five or thirty years longer. If production is curtailed and waste stopped, it may last till the end of the century. The most important effects of its disappearance will be the lack of lubricants and the loss of illuminants. Animal and vegetable oils will not begin to supply its place. This being the case, the reckless exploitation of oil fields and the consumption of oil for fuel should be checked.

In natural gas the waste is enormous; 1,000,000,000 cubic feet are estimated to be wasted into the air every twenty-four hours. The gas supply will last about twenty-five years—about as long as it has already been utilized.

IRON

Iron is very abundant in nature, but usually is found in ores so poor that it cannot be extracted at any reasonable cost. The best ores are being rapidly worked, and it is estimated that within thirty years they will have been exhausted, and that it will be necessary to resort to ores that cannot now be worked at a profit. This, of course, means higher prices unless new and much cheaper processes shall have been invented.

GOLD, SILVER, ETC.

Gold, silver and zinc are all so abundant that the supply is likely to last for centuries. Copper is also abundant, but is largely in low-grade ores, which cannot now be profitably worked. At increased prices, however, the supply will probably be abundant. For lead, however, the outlook is much less favorable. Its production in the United States is still increasing slightly, but is decreasing elsewhere in the world, and this despite a marked increase in prices. Probably the world's output has already reached a maximum, and will henceforth decline.

The phosphates, it is estimated, will be exhausted in about twenty-five years, and the farmer will then have to look elsewhere for fertilizers.

Fresh supplies of all these materials may, of course, be found, but (except for gold) it seems unlikely that they will be great enough or valuable enough to materially affect the estimates.

Bulletin 394 can be had, free of charge, from the director, United States Geological Survey, Washington, D. C.



Utilizing Waste

When the great lumber barons stripped Wisconsin, Minnesota, and Michigan of their pine trees, the land was considered practically valueless and not worth the cost of clearing it of stumps. But now the chemist has come to the rescue and demonstrated that there is wealth in the waste pine stumps. The stumps are therefore being grubbed out, broken up, and placed in retorts, where by distillation valuable products are obtained. Tar and turpentine are the direct products, and the charcoal residue is also proving of

value. From the turpentine comes acetic acid, formaldehyde, creosote, and wood alcohol, and an endless variety of color dyes. Among the by-products are embalming fluid, shingle stain, sheep dip, metal polish, lacquer, and tree spray. In addition, the cleared land is worth something for cultivation.—*Omaha (Nebr.) Bee.*



Squirrels Menacing Forests

The tree squirrel is reported as menacing pine forests in California. His principle food is the pine nut. With the cutting of pine timber the supply of nuts diminishes, the result being an intensified competition by squirrels for food, with the consumption of practically the entire crop of pine nuts. In consequence the stand of pine trees for the future is threatened. The question is arising whether the trees should be protected at the expense of the squirrels or vice versa, or whether some mode may be devised for protecting both.



Making Engines Spark-proof

The first inspection by representatives of the public service commission, second district, of all locomotives to be used within the forest preserve of the Adirondacks disclosed that forty-three per cent failed to meet the requirements named by the commission, owing to defects in the spark arresters or ash pans. These were ordered corrected; and, later, three examinations were necessary on two of the roads before the engines were put in satisfactory condition. On the New York and Ottawa, nine out of ten examined were found to be defective upon the first inspection, and on the Carthage and Adirondacks, every locomotive proved to be more or less defective.

On the Mohawk and Malone division of the New York Central, the general mechanical condition of the locomotives was found to be good, practically all the engines having had general repairs at the West Albany repair shops within four or five months. A result of this thorough work is that practically all of the locomotives on the division are in good operating condition, and responsible mechanical officers of the New York Central have advised that this has resulted in a substantial saving of fuel, which has more than offset the increased cost of inspection and experimenting made necessary by the proceedings and order resulting from the forest-fire investigation of the commission.

Additional inspections will be made each month during the summer to ascertain whether the spark arresters and ash pans on the railroads operating in the Adirondacks are maintained in satisfactory condition, and whether the other requirements of the commission's orders are being enforced.—*New York Commercial.*

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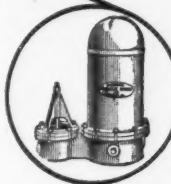
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Membership coincides with the calendar year

S. A.

Nominations for Membership

The activities of the National Office of the American Forestry Association are limited chiefly by its resources. These are derived almost wholly from its members in the form of dues. Every member is urged to aid in increasing the membership. Kindly fill out the enclosed blank form, lengthening the list, where possible, by attaching and filling blank sheet. The list should then be sent to

OTTO LUEBKERT
Secretary American Forestry Association
1417 G Street Northwest, Washington, D. C.

I hereby nominate the following persons for membership in The American Forestry Association:

Name

Address

.....
.....
.....
.....

Signed

To the Members:

Your Board of Directors conclude their last annual report with the following:

"Inland navigation, deeper waterways, water powers, and economical manufacturing therewith, floods, soils, irrigation, drainage and the public health, as shown in detail by one of our folders, are all fundamentally dependent upon and related to Forestry. This larger field of conservation and utilization of all our natural resources plainly places upon our Association duties which should be heartily assumed, and diligently discharged.

"In closing, it should be said that, in comparison with the work remaining to be done, the work already accomplished by all the forestry forces combined is slight. Destruction of resources proceeds without abatement. Sentiment now developing should be intensified, and focused upon local, state and national governments, that legislation and administration may accomplish the ends without which all our efforts are vain.

"The American Forestry Association is a leading agency for general propaganda in this field. Its efforts are strictly limited by its means. Where it receives hundreds, it should receive thousands of dollars for the prosecution of the great work before it. For this arm of power it looks to its members. Their dues are practically its only resource. Each member may, however, enlist other members, and by so doing, render to his country a patriotic economic service of great value."

Use blank on the preceding page and enlist another member

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